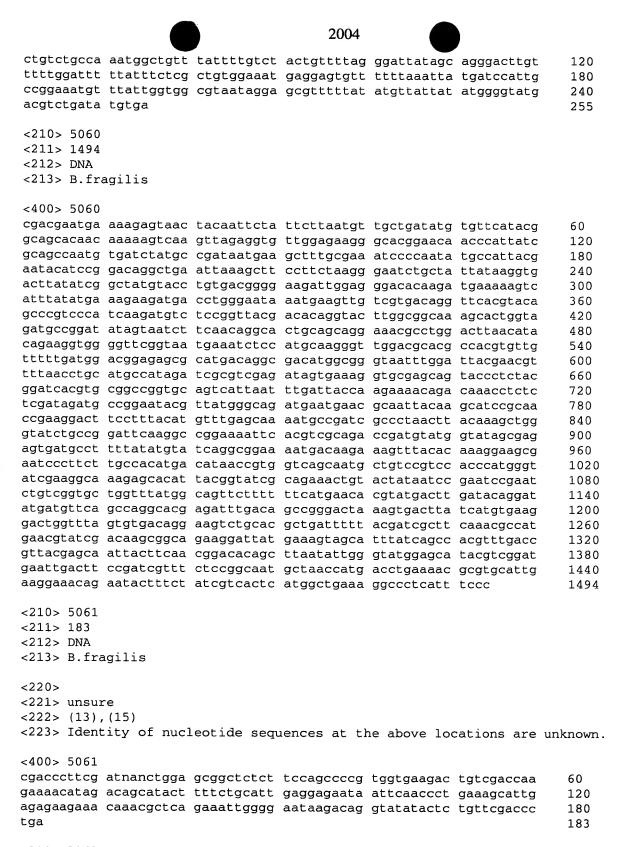
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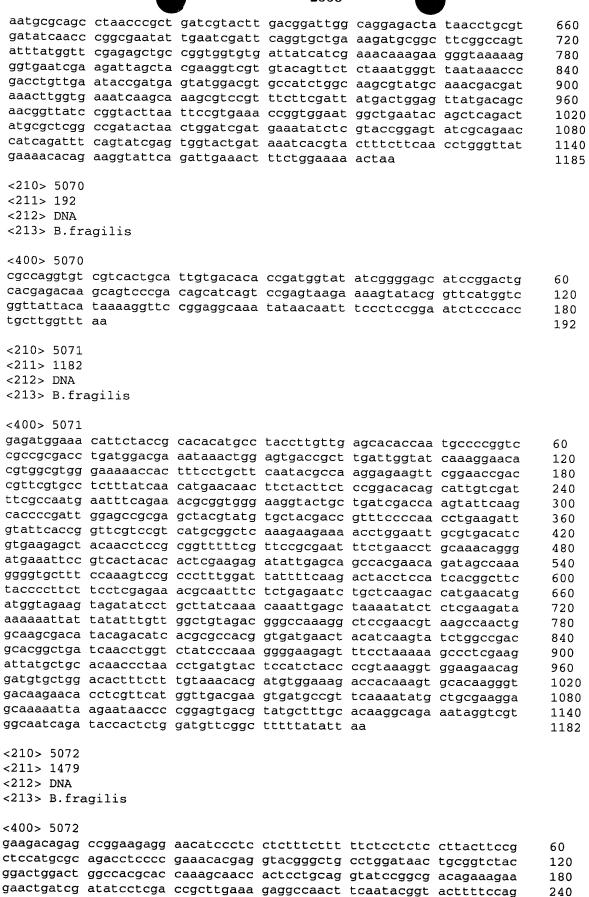




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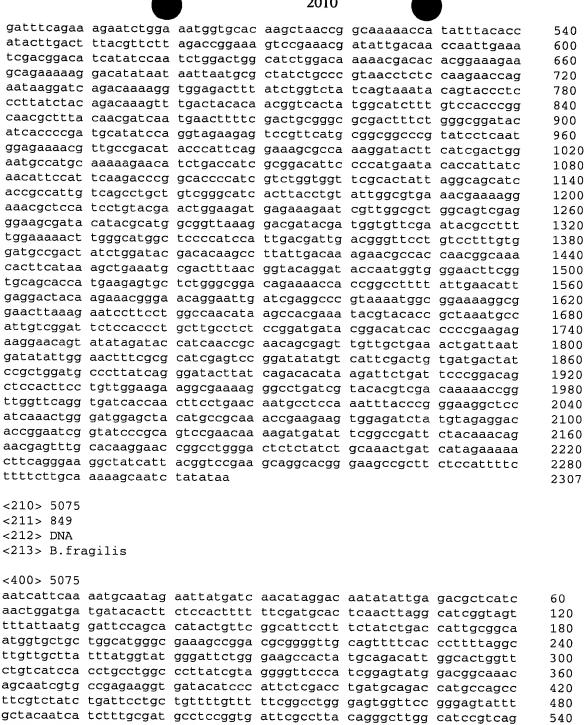
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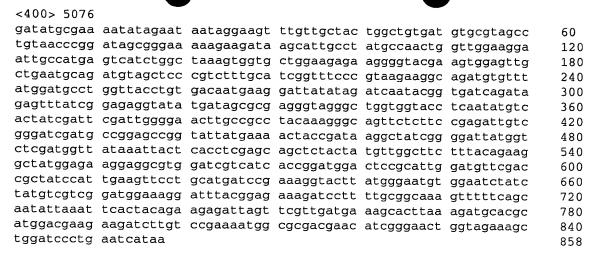
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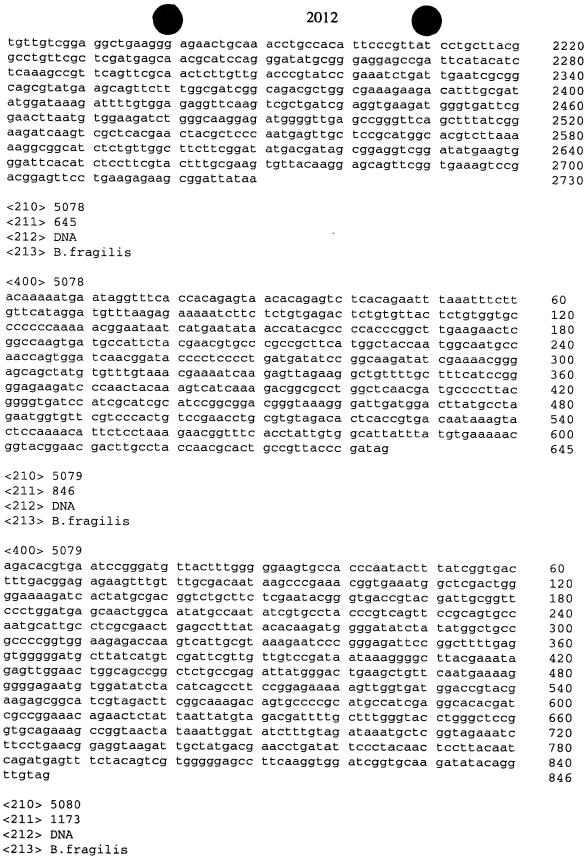
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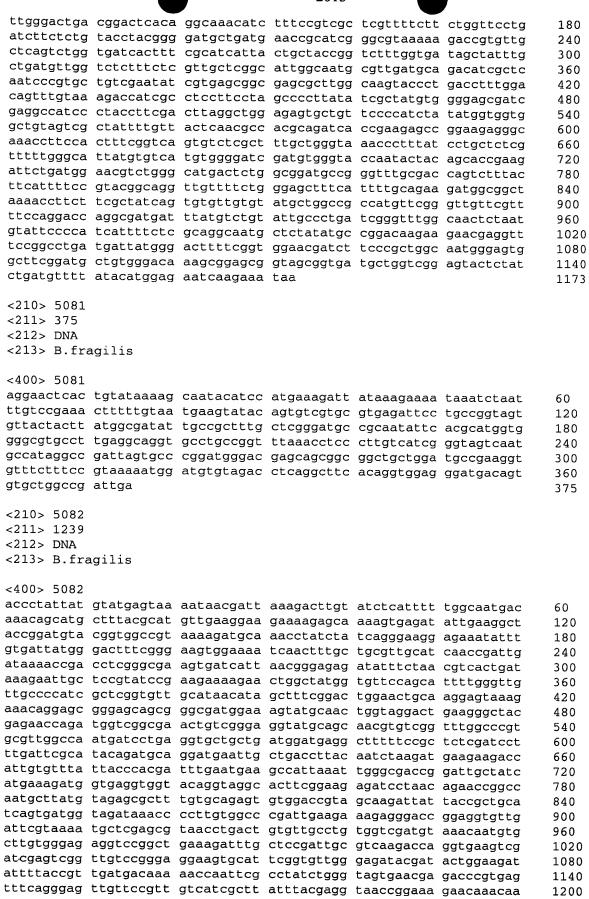
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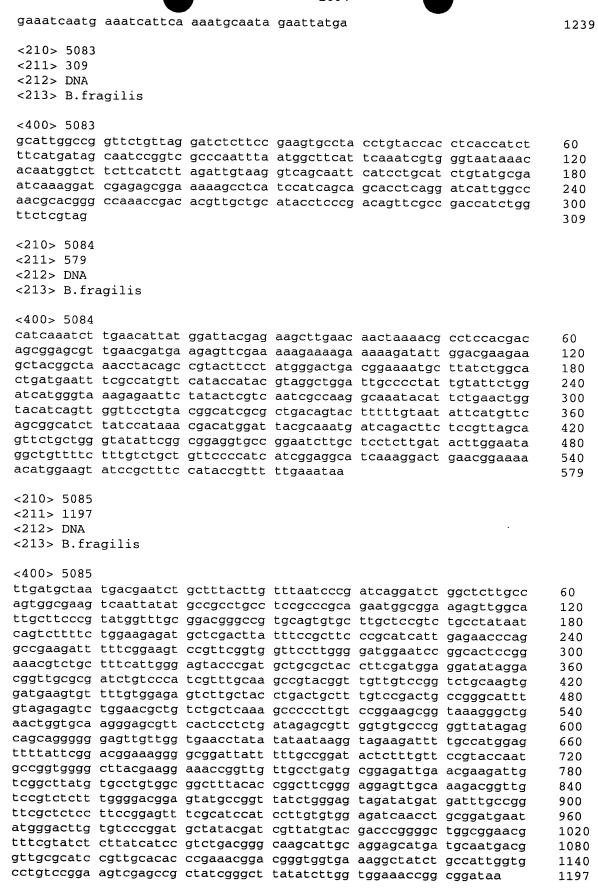




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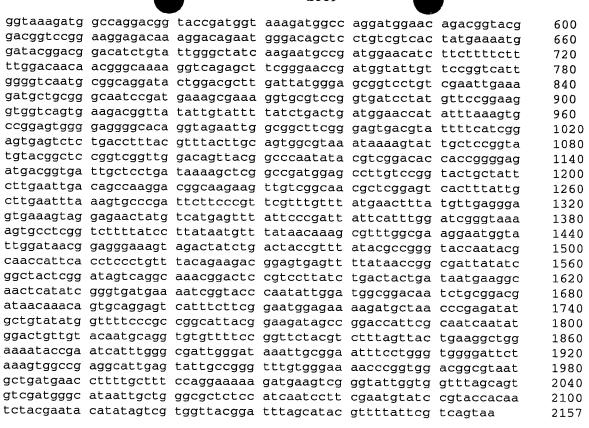
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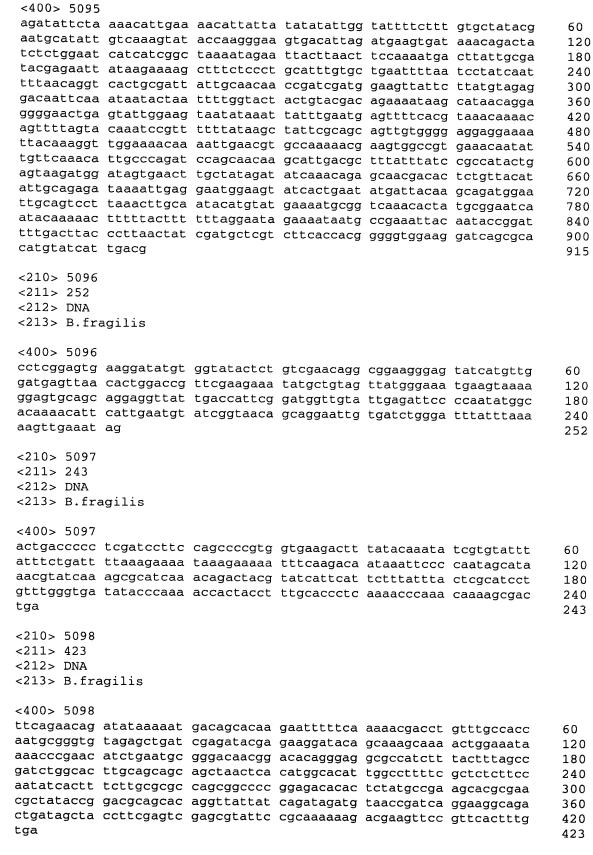
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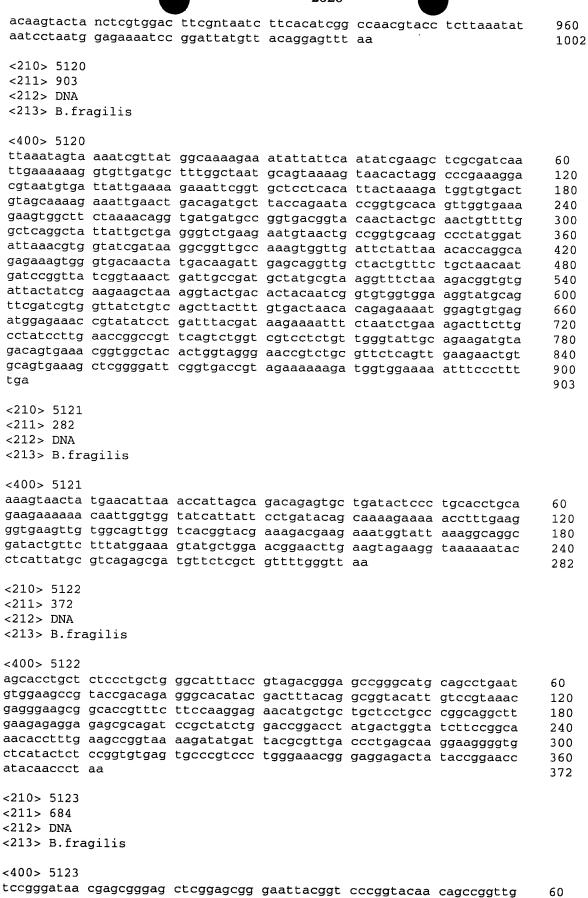
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LN
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C
                                                                           420
     tatatggcta tgcgtgacgg caatgagtct acgattccca aagatgattt gaggcccaag
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     tctaattatt ttccagaagc tctgcaagct cagcatagct attttaaact catacccact
                                                                           180
    tecteggaag gaggagateg cecaegacee gateatteae taaagaaaca acaaataett
                                                                           240
    aacattatga aatcatttaa aatcatgctc atcacggtat tatccgtaat gactctgagt
                                                                           300
    tgtagcgaga aaacgacgac agaaattcct gaaacagaat tgaaaaacat tagttgtagc
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                                                                           420
    gaaaacgatt tcgtgcttta tgcattcaaa aaaaacggtg aaggtaactt tagttatgaa
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    gaagccaaac atgaaacaag tgtcattgat ggcggagttt ggaaatacaa tgcagctttc
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    ccggtaggca cctacaaatt catcgcattt tataacctgg acgagaagaa ccaagccgct
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    ctcaacacga ccataacagg tatcagtaac caaacttggg aaaacatatt gaagagtatt
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    gttattaccc attttccttc cgccaccgat caataccatg aagatatgaa tgaaatattc
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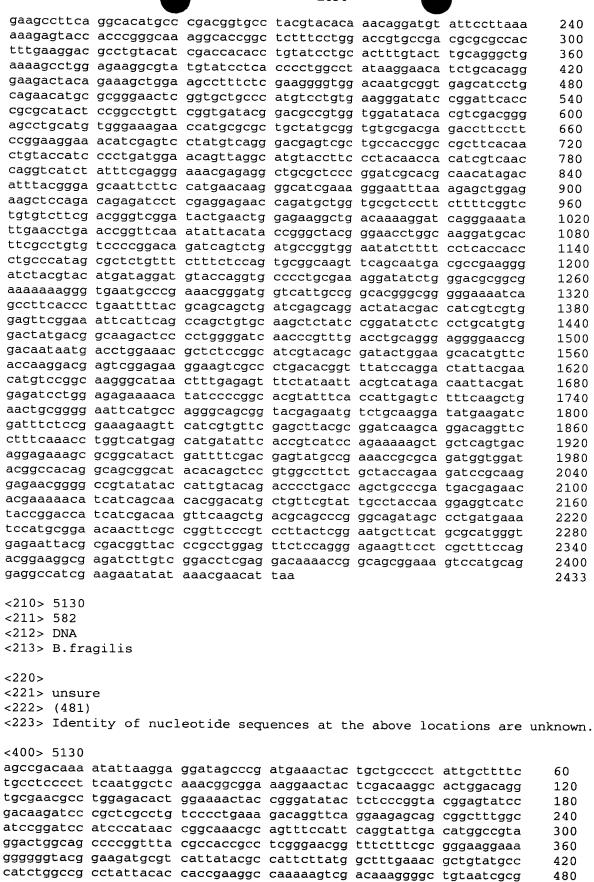
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L
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ĪΨ
E
[]
ű
= 122
C)
G
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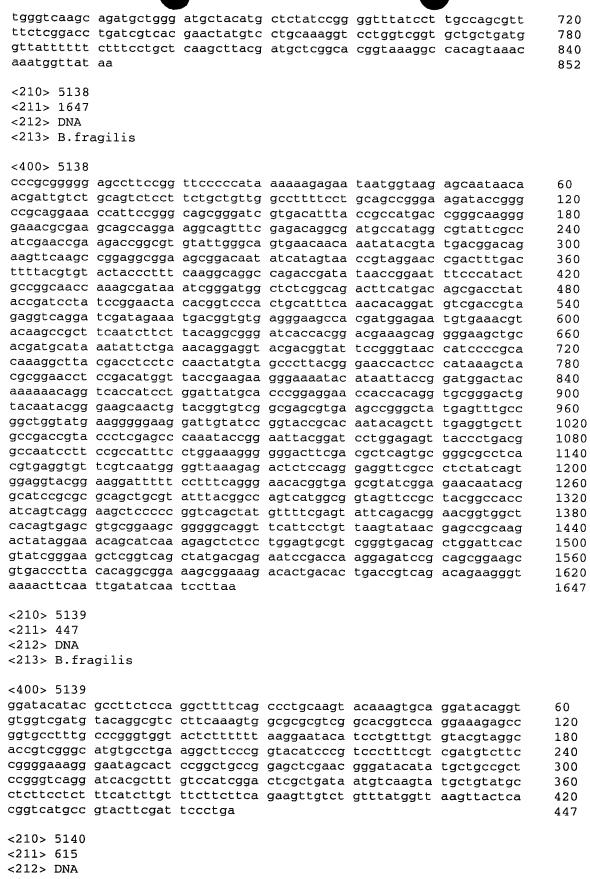
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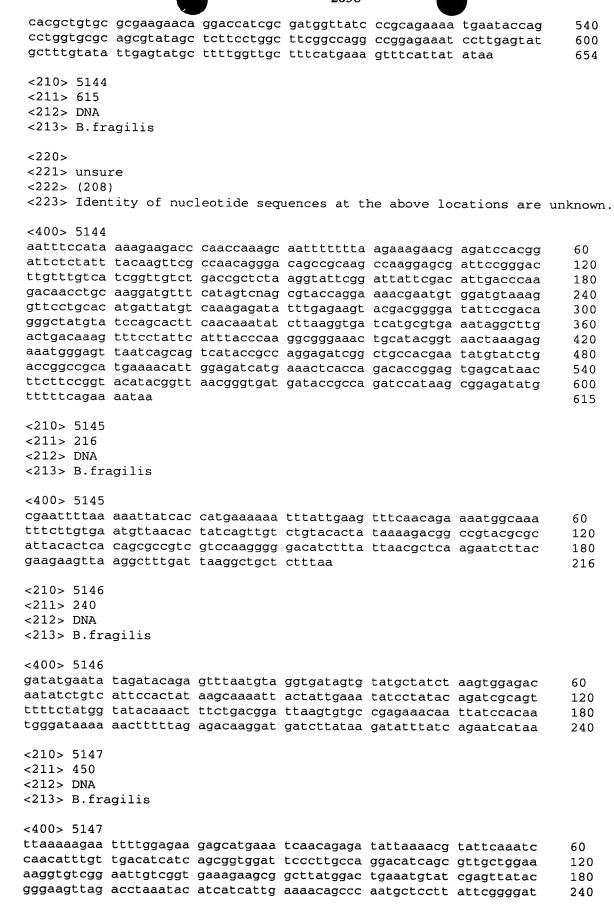
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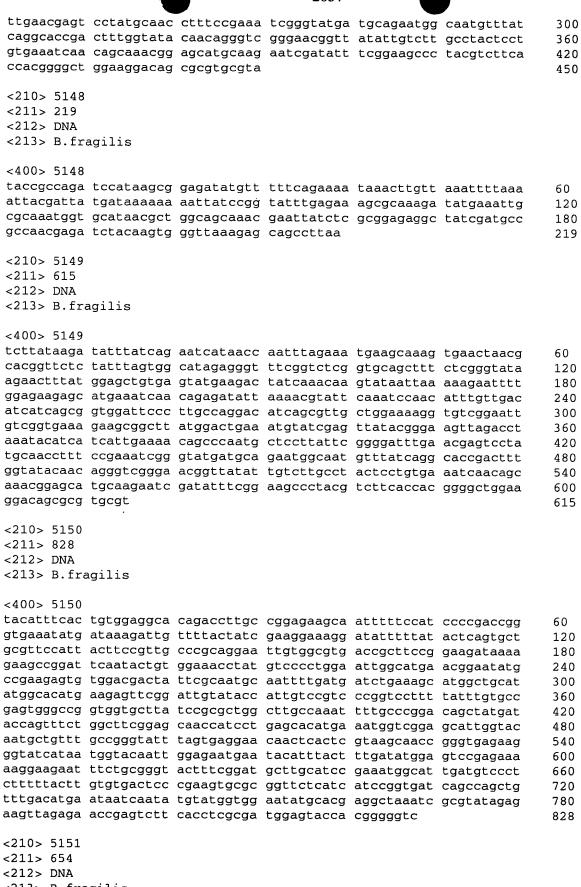
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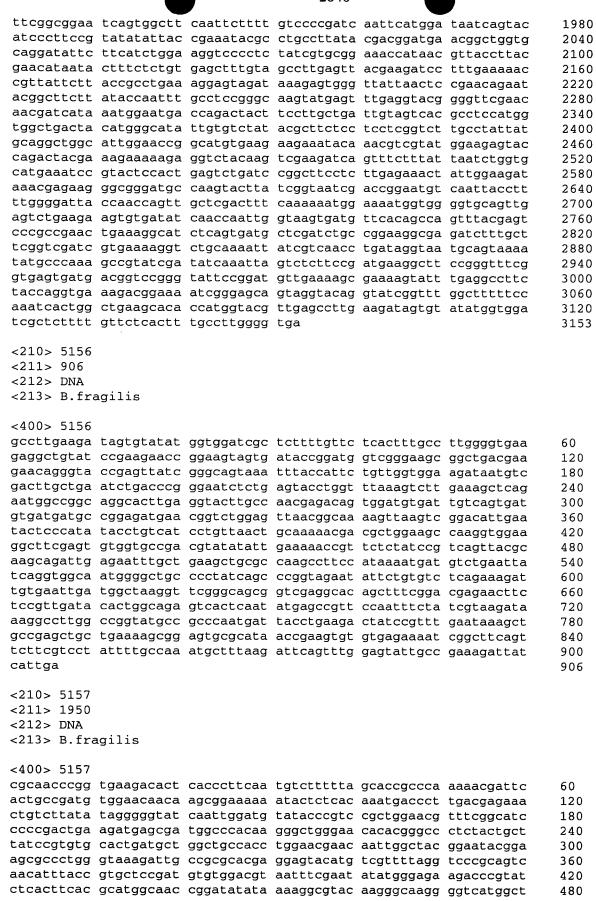
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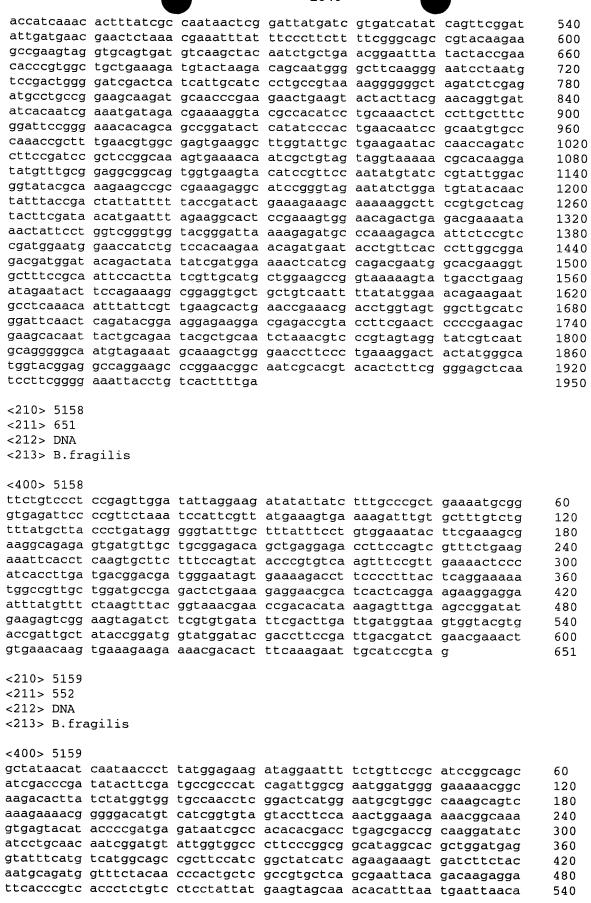
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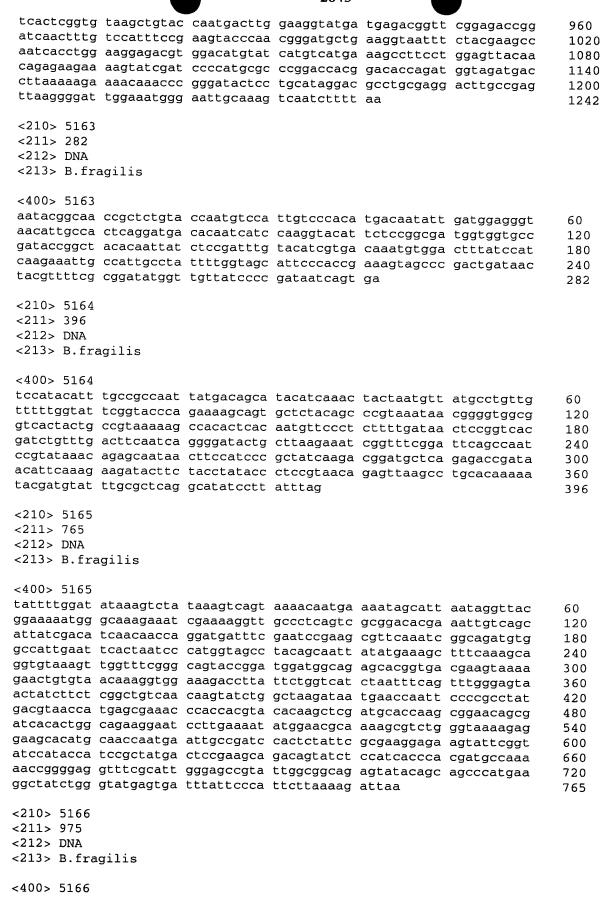
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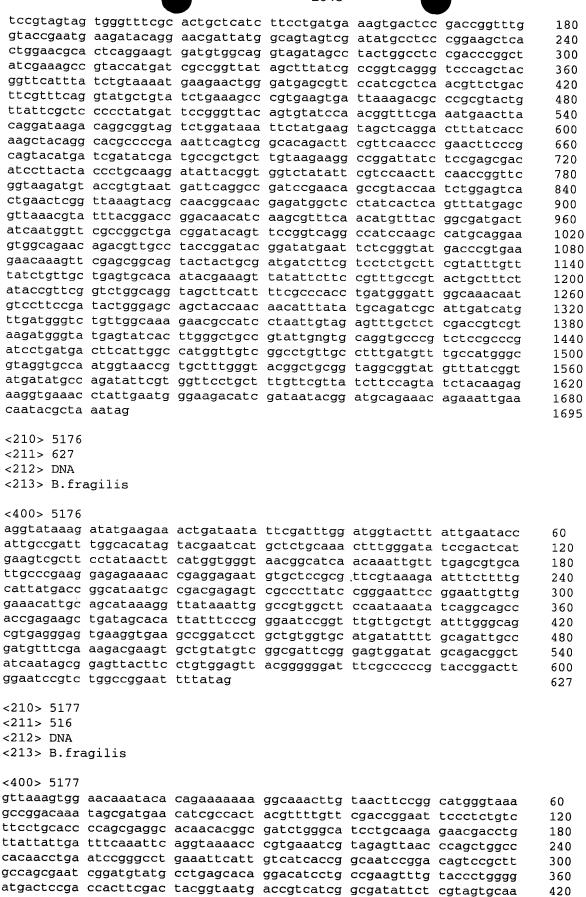
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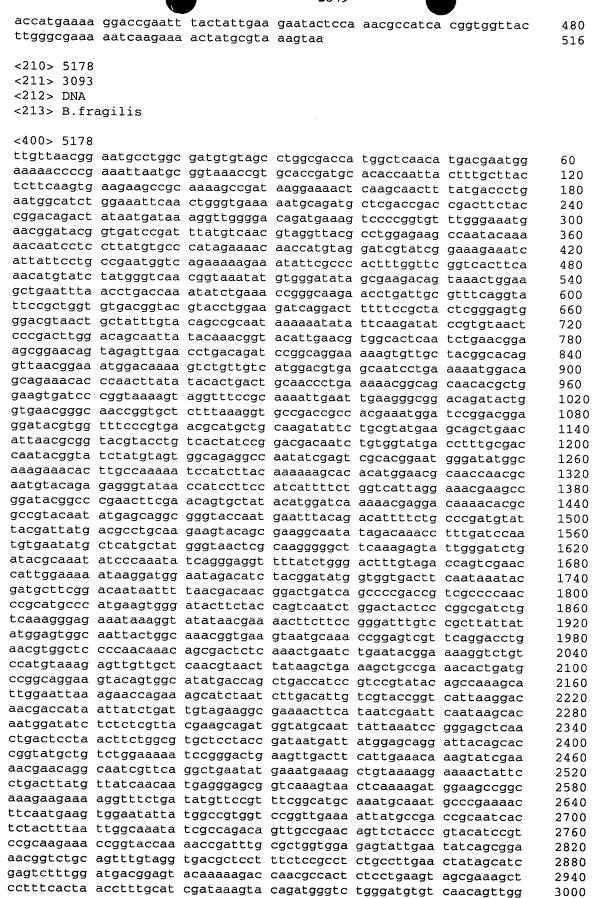
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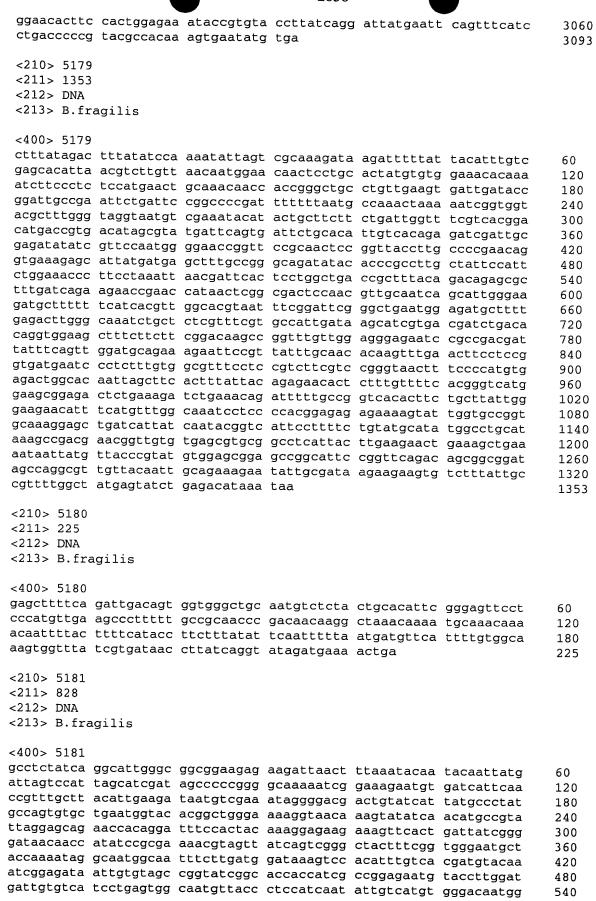
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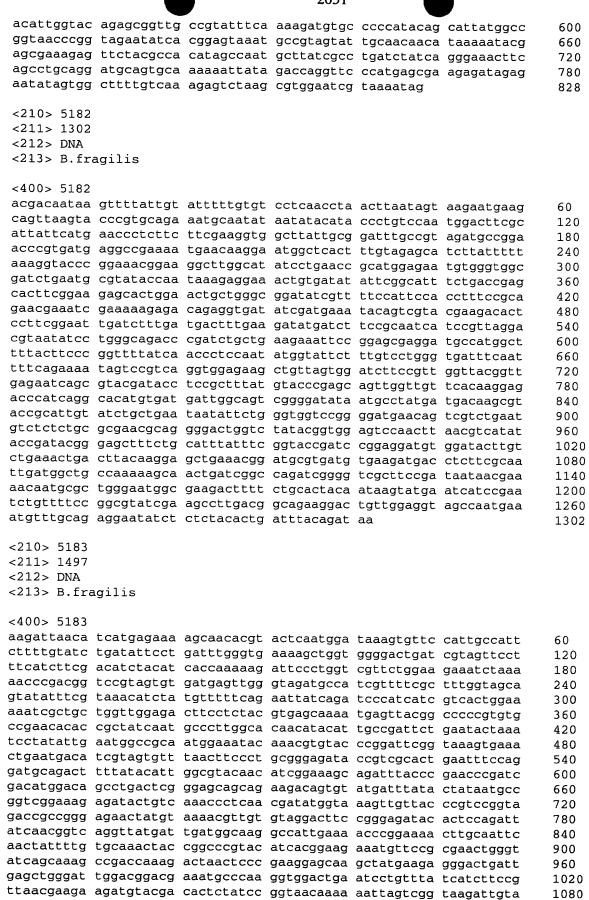
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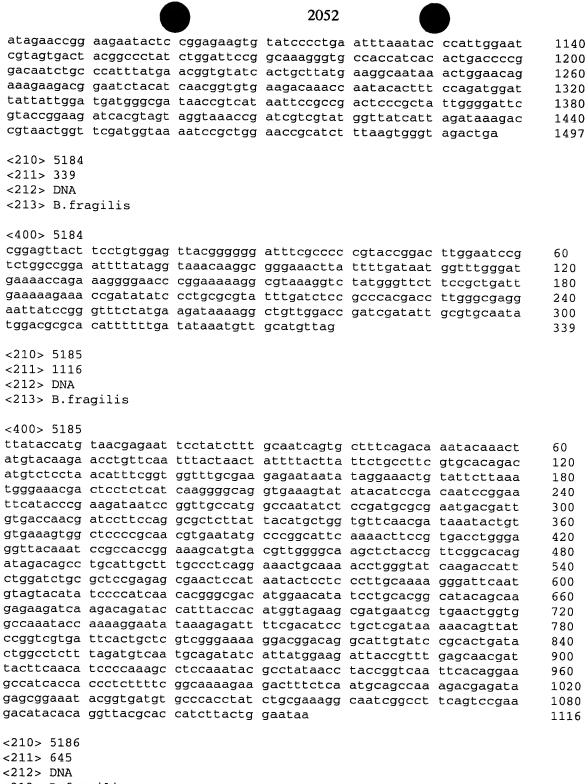
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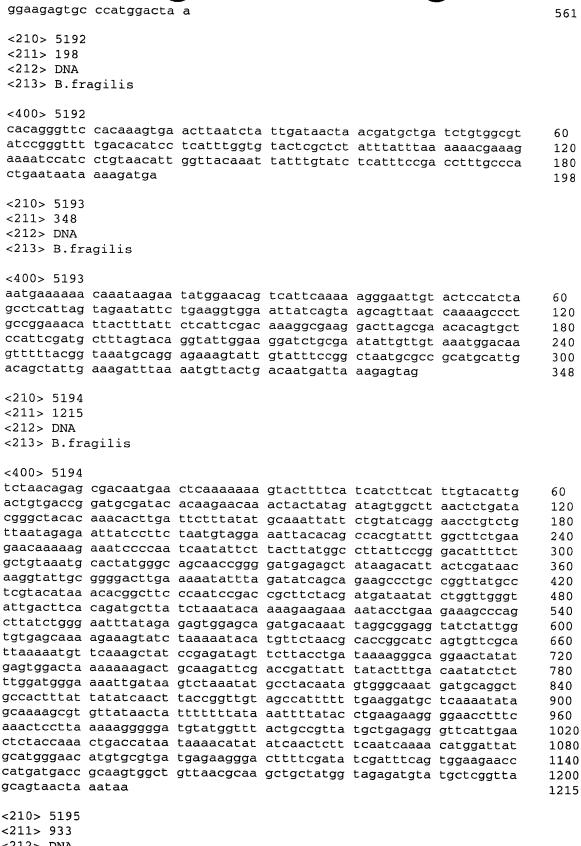
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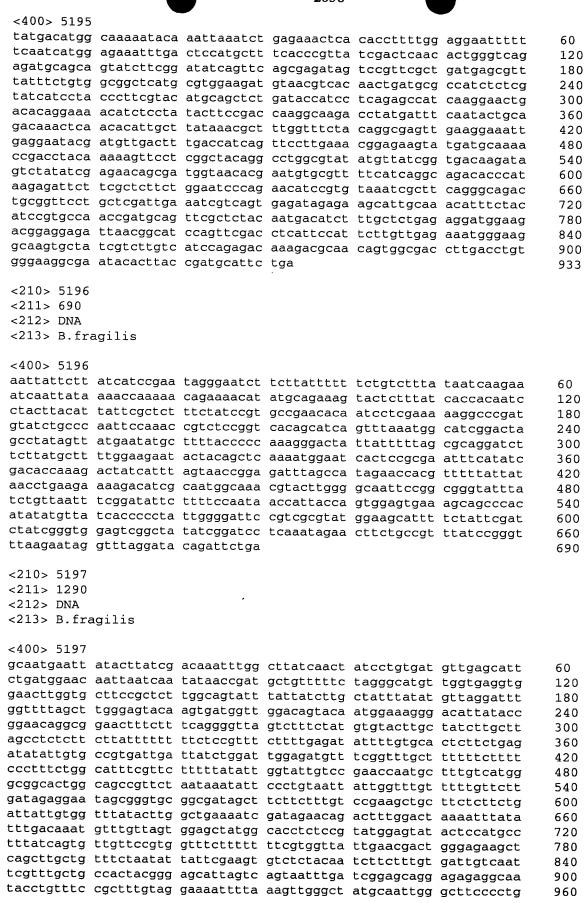
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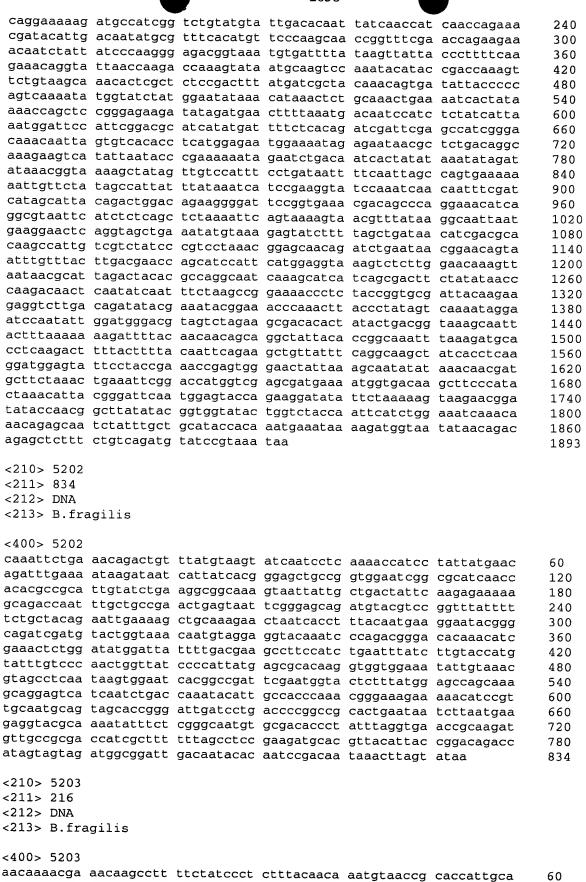
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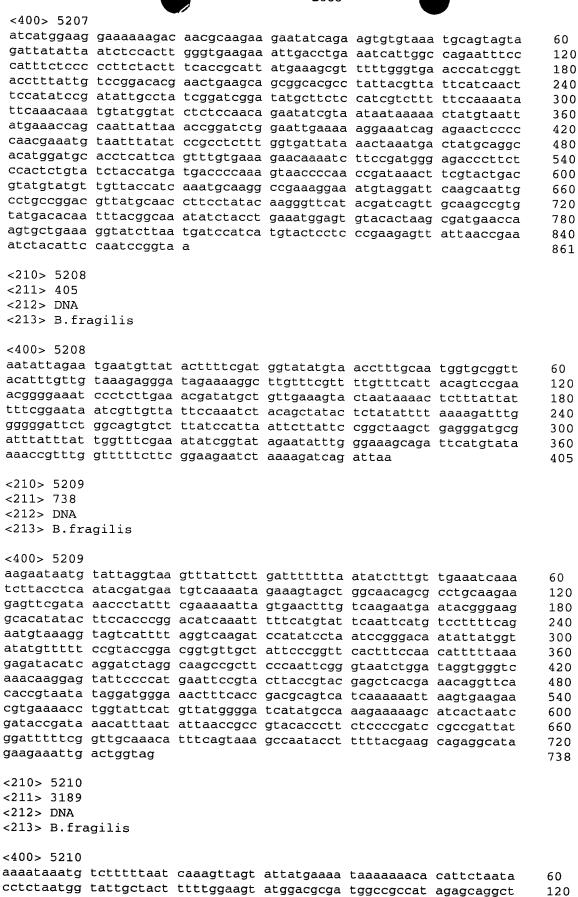


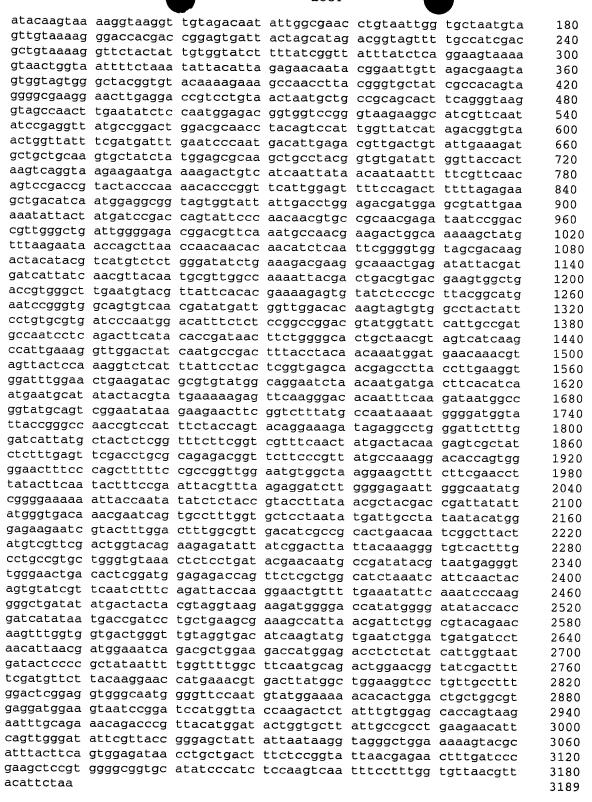
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216

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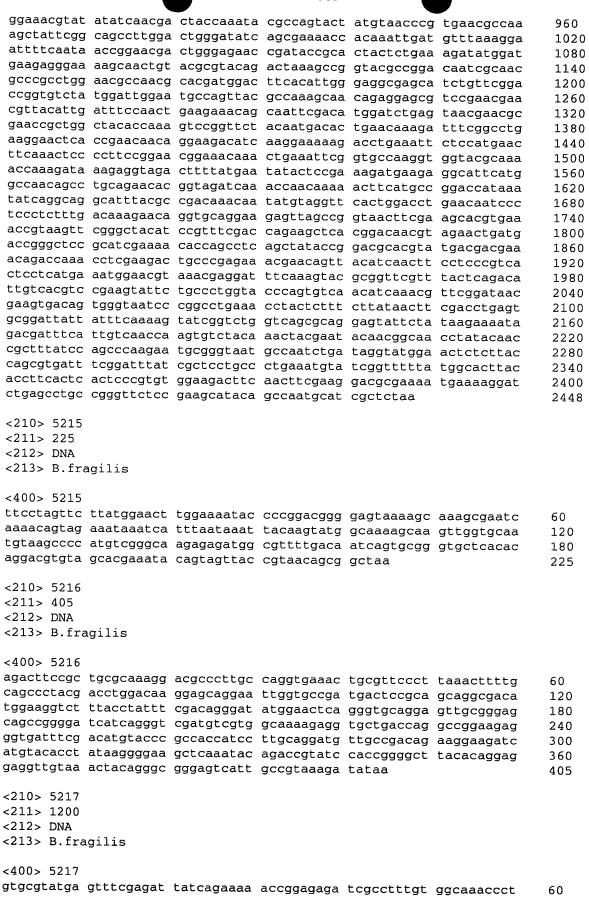
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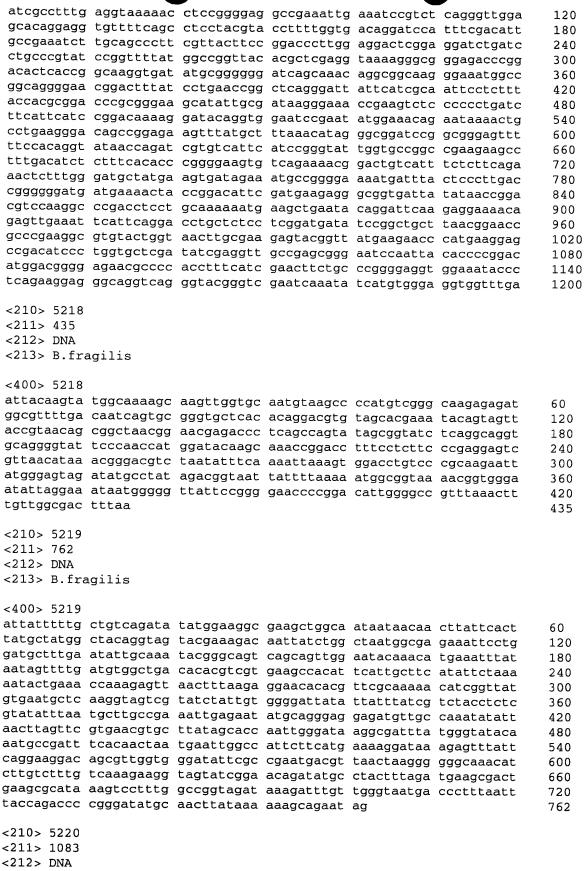
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32 522
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D

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<212> PRT
<213> B.fragilis
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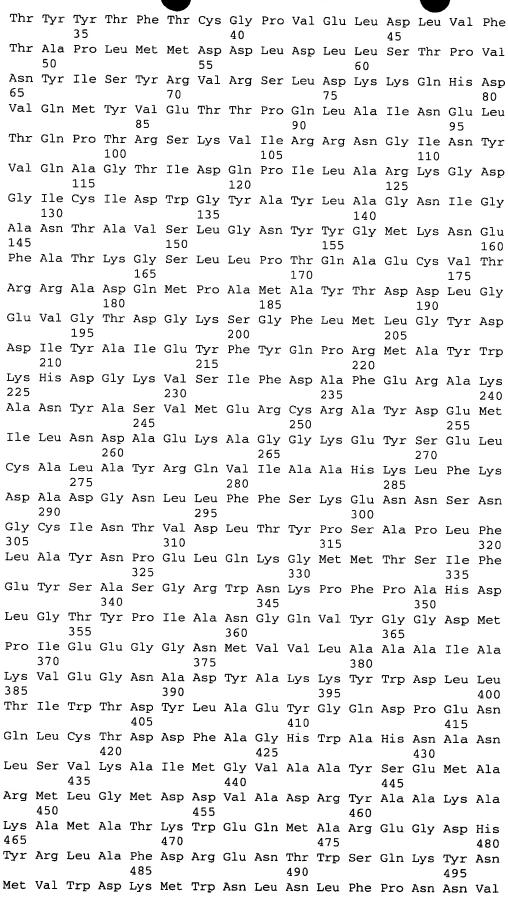
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20 25 30



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Leu	Tyr	Asn	Tyr	Ser 645	Gly	Gln	Pro	Trp	Lys 650	Ala	Gln	His	Trp	Ile 655	Arg
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Lys Ala Lys Val Leu Cys Gly Ala Ser Arg Ile Tyr Asp Glu Lys Ala 645 650 Gly Lys Arg Ser Tyr Ser Phe Val Ala Lys Ser Pro Leu His Thr Thr 665 Asn Ala Ser Arg Ile Leu Leu Pro Lys Gln Pro Ile Arg Val Cys Val Asn Gly Lys Glu Glu Pro Gln Pro Glu Lys Leu Trp Glu Glu Arg Ser 695 700 Arg Thr Leu Leu Lys Phe Glu Asn Asp Pro Ala Gly Val Gln Val 710 715 Asp Ile Glu Trp

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<213> B.fragilis

<400> 5233

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Ser Asp Gly Val Asn Ser Leu Pro Glu Leu Glu Leu Ser Tyr Ser Ala 55

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Leu Lys Ile Lys Lys

<210> 5234

<211> 493

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<213> B.fragilis

<400> 5234

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Ala Glu Gly Met Leu Ser His Tyr Thr Cys Val Ala Asp Ala Ile Gln 40

Lys Asp Asn Arg Pro Glu Pro Ala Lys Arg Leu Phe Arg Ser Gln Ala 55

Val Glu Asn Glu Ile Ile Arg Val Gln Lys Leu Leu Arg Asn Ser Lys 75

Leu Ala Trp Met Phe Thr Asn Cys Phe Pro Asn Thr Leu Asp Thr Thr 85 90

Val His Phe Arg Lys Gly Lys Asp Gly Lys Pro Asp Thr Phe Val Tyr 105

Thr Gly Asp Ile His Ala Met Trp Leu Arg Asp Ser Gly Ala Gln Val 120

Trp Pro Tyr Val Gln Leu Ala Asn Ser Asp Pro Glu Leu Lys Thr Met 135 140

Leu Ala Gly Val Ile Asn Arg Gln Phe Lys Cys Ile Asn Ile Asp Pro 150

Tyr Ala Asn Ala Phe Asn Asp Gly Pro Lys Gly Glu Trp Met Ser

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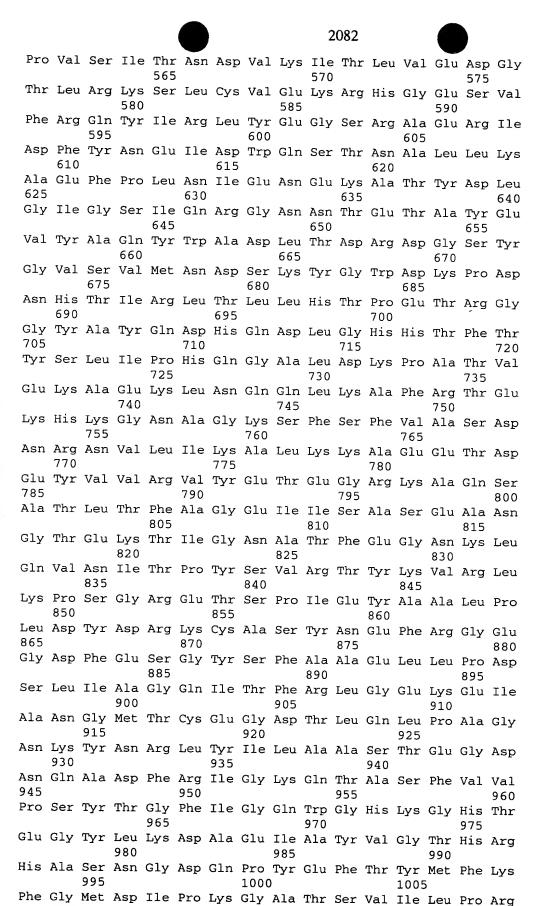
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Asp Val Gln Thr Thr Ile Lys Glu Tyr Val Trp Asn Thr Ile Asn Gln 50
Asn Leu Phe Leu Leu Lys Lys Lys Tyr Pro Asn Tyr Val Phe Asn Phe Glu 65
Gly Gly Val Lys Tyr Ala Trp Met Lys Glu Tyr Glu Tyr Tyr Pro Ala Gln Tyr

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Glu	G1 <sub>11</sub>	Mot	Two	85	Пъ гъс	T1.		. 01	90		-			95	
			100					105					110		Gly
		115					120					125			Phe
Ile	Arg 130	Asn	Ile	Met	Leu	Gly 135		Gln	Tyr	Tyr	Arg 140	Gln	Glu	Phe	Gly
Val 145	Glu	Ser	Thr	Asp	Ile 150		Leu	Pro	Asp	Cys 155	Phe	Gly	Phe	Gly	Trp 160
Thr	Leu	Pro	Thr	Ile 165	Ala	Ser	His	Cys	Gly 170	Leu	Ile	Gly	Phe	Ser 175	Ser
Gln	Lys	Leu	Asp 180	Trp	Arg	Val	His	Pro 185		Tyr	Gly	Lys	Ser 190		
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		275					280			Leu		285			
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				325					330	Asp -				335	
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385					390					Val 395					400
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			420					425		Thr			430		
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			500					505					510		
		515					520			Asn Phe		525			
	530					535				Glu	540				
545					550		.41	neu		555	TIIT	1111	usb	Arg	560



Asn Glu Lys Val Val Leu Phe Ala Ala Thr Leu Val Ala Glu Asn Glu



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<211> 619

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<213> B.fragilis

<400> 5236

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Met Thr Glu Asp Gln Val Tyr Gly Asp Val Asn Leu Thr Lys Ser Val 40

Leu Ala Asn Phe Tyr Glu Arg Ile Ser Leu Gly Gln His Val Gly Asp

Thr Asp Gly Phe Ala Leu Leu Asp Glu Ala Ile Thr Tyr Asp Thr Lys 75

Asp Asp Gln Glu Val Asp Arg Asn Trp Trp Arg Thr Tyr Asp Tyr Thr 85 90

Leu Ile Arg Asn Ile Asn Gln Phe Leu Lys Gly Leu Arg Glu Ser Thr 105

Ala Leu Ser Glu Val Glu Lys Ala Pro Met Glu Gly Glu Ala Arg Phe 120 125

Ile Arg Ala Trp Val Tyr Phe Cys Thr Cys Arg Thr Leu Gly Gly Met 135 140

Pro Ile Val Gly Asp Glu Val Tyr Asp Tyr Thr Ser Gly Met Asp Ile 150 155

Thr Thr Leu Gln Val Pro Arg Ala Thr Glu Ser Ala Met Tyr Asp Tyr 170

Ile Ile Glu Glu Cys Lys Thr Ile Ala Glu Met Leu Pro Thr Glu Pro 185

Ser Lys Asn Gly Ala Arg Ala Thr Lys Trp Ala Ala Lys Met Leu Glu 200 205

Ala Arg Ala Ala Val Tyr Ala Gly Ser Ile Ala Arg Tyr Asn Thr Val 215 220

Ala Asp Tyr Pro Leu Leu Asn Pro Glu Thr Gly Val Val Gly Ile Ser

230 235 Ser Glu Lys Ala Thr Asp Tyr Tyr Lys Lys Ala Leu Ala Ala Glu 250 Glu Val Ile Asn Ser Gly Lys Tyr Ser Leu Met Arg Val Ala Asp Asp 260 265 Ala Thr Pro Gln Glu Lys Ala Asp Asn Phe Phe Lys Ala Val Cys Glu 280 Lys Asn Gly Asn Thr Glu Val Ile Trp Ser Arg Asp Tyr Ile Tyr Pro 295 Gly Gln Thr His Gly Tyr Thr Lys Ser Val Gln Pro His Asp Gly Ala 310 315 Glu Asp Gly Gly Asn Ser Arg Leu Ser Ala Leu Leu Asn Leu Val Glu 325 330 Ala Phe Glu Pro Ile Ala Thr Asp Thr Pro Gly Glu Gly Ala Lys Phe 340 345 Asp Val Gly Thr Lys Asp Asn Pro Lys Phe Tyr Thr Asn Pro Glu Asp 360 Leu Phe Val Gly Arg Asp Pro Arg Leu Ala Gly Thr Ile Leu Tyr Pro 375 Gly Ser Ser Phe Arg Asp Arg Thr Val Val Leu Gln Thr Gly Gln Trp 390 395 Ile Lys Asn Ser Asp Gly Gln Trp Glu Gln Lys Leu Gly Gln Ser Leu 410 Gly Glu Lys Asp Asp Gln Gly Arg Tyr Val Thr Ala Leu Asn Gly Pro 420 425 Met Val Arg Asn Asp Gln Arg Glu Cys Asn Arg Thr Gly Phe Tyr Val 440 Arg Lys Tyr Leu Asp Lys Thr Thr Ser Ala Gly Thr Asp Arg Gly Ser 455 460 Glu Met Trp Asn Val Tyr Phe Arg Leu Ser Glu Ala Tyr Leu Ile Ala 470 475 Ala Glu Ala Ala Tyr Glu Leu Asn Gly Gly Ser Asp Ala Thr Ala Leu 485 490 Lys Tyr Ile Asn Ala Val Arg Ser Arg Ala Gly Val Lys Glu Leu Ala 500 505 Ser Val Asn His Gln Gln Ile Met His Glu Asn Gln Val Glu Phe Ala 520 525 Phe Glu Gly His Arg Trp Trp Asp Leu Lys Arg Trp Arg Gln Ala Asp 535 540 Lys Ile Trp Thr Gly Ser Glu Met Asp Ile Thr Ala Thr Arg Arg Gly 550 555 Leu Trp Pro Phe Leu Val Val Ser Asp Asp Asp Lys Asn Gly Lys Trp 565 570 Val Phe Phe Glu Glu Asn Met Asn Arg Tyr Tyr Arg Asn Pro Leu Lys 585 590 Cys Leu Pro Lys His Tyr Tyr Ala Glu Leu Asp Asn Gly Trp Leu Asn 600 Asn Asn Pro Lys Leu Val Lys Asn Pro Tyr Gln 610 615 <210> 5237 <211> 427 <212> PRT <213> B.fragilis

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Asn Arg Tyr Trp Leu Met Phe Ile Asn Ser Leu Arg Lys Ser Pro Phe

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Ile Arg Gly Leu Phe Leu Ile Tyr Ile Phe Ser Met Lys Lys Leu Leu 10 Phe Ser Leu Phe Thr Val Phe Ser Phe Cys Val Pro Ser Ile Ala Gln 25 Gln Tyr Ser Asn Pro Val Ile Asn Tyr Ser Leu Pro Asp Pro Thr Val 40 Ile Lys Ala Asp Asp Gly Tyr Tyr Tyr Leu Tyr Ala Thr Glu Asn Ile 55 Arg Asn Leu Pro Ile His Arg Ser Lys Asp Met Val Asn Trp Ser Phe 70 75 Val Gly Thr Ala Phe Thr Asn Glu Thr Arg Pro Thr Phe Glu Pro Lys Gly Asn Leu Trp Ala Pro Asp Ile Asn Lys Ile Gly Asp Arg Tyr Val 105 Met Tyr Tyr Ser Met Ser Val Trp Gly Gly Glu Trp Thr Cys Gly Ile 115 120 125 Gly Val Ala Thr Ala Asp Lys Pro Glu Gly Ser Phe Thr Asp His Gly 135 140 Lys Leu Phe Arg Ser Asn Glu Ile Gly Ile Gln Asn Cys Ile Asp Pro 150 155 Phe Tyr Ile Glu Asp Gly Gly Lys Lys Tyr Leu Phe Trp Gly Ser Phe 165 170 His Gly Ile Tyr Gly Ala Glu Leu Ser Asp Asp Gly Leu Ser Leu Lys 180 185 Glu Gly Met Lys Pro Gln Gln Val Ala Gly Thr Ala Tyr Glu Gly Thr 200 Tyr Ile His Lys Arg Gly Gly Tyr Tyr Tyr Leu Phe Ala Ser Ile Gly 215 220 Arg Cys Cys Glu Gly Leu Lys Ser Thr Tyr Thr Thr Val Val Gly Arg 235

Ser Lys Tyr Leu Phe Gly Pro Tyr Val Asp Lys Lys Gly Glu Ser Met

Leu Glu Asn His His Glu Val Leu Ile Asp Lys Asn Glu Ala Phe Val

<210> 5240 <211> 147 <212> PRT

<213> B.fragilis

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Ile Asn Cys Ile Met Asn Lys Lys Phe Phe Ile Ala Met Leu Ala Phe 1 5 10 15 Ala Leu Phe Gly Met Thr Asn Val Met Ala Asn Thr Ser Lys Asp Glu 20 25 30

Val Val Glu Val Ser Ser Thr Asn Lys Val Thr Ala Thr Glu Tyr Tyr 35 40 45

Leu Glu Ala Ala Gly Gln Ser Gly Ser Gly Leu Phe Tyr Ser Ile Glu 50 60

Leu Leu Asp Ser Ser Gln Arg Lys Leu Lys Ile Thr Ala Lys Arg Gly 65 70 75 80
Leu Arg Ile Glu Ile Asn Cys His Gly His Gly Ile Val Pro Asp Asp

85 90 95
Arg Leu Phe Tyr Thr Ser Asp Ser Trp Thr Gly Glu Val Ile Thr Asp

Glu Ile Asn Thr Glu Ala Phe Thr Ile Ser Thr Ser Tyr Asn Glu Ser

Ala Gly Ser Ser Ser Thr Thr Lys Tyr Glu Thr Arg Tyr Tyr Tyr Ile
130 135 140

Arg Glu Arg

145

<210> 5241 <211> 161 <212> PRT

<213> B.fragilis

<400> 5241

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Leu Lys His Phe Thr Lys Lys Asp Ala Thr Thr Ala Met Asp Ala Phe 35 40 45

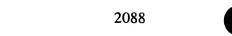
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Asp Met Lys Gly Arg Ala Ala Ile Trp Val Gln Ala Ile Tyr Trp Asp 65 70 75 80

Met Ile Met Asn Ala Tyr Lys Arg Thr Lys Ala Pro Lys Tyr Arg Arg 85 90 95

Leu Ile Glu Glu Val Tyr Gln Gly Gly Tyr Glu Gln Tyr Asp Lys Tyr 100 105 110

Asn Trp Asp Asn Lys Ile Glu Trp Phe Ile Tyr Asp Asp Met Met Trp 115 120 125



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<212> PRT

<213> B.fragilis

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Glu Ser Met Leu Thr Gly Lys Val Val Tyr Glu Gly Glu Ala Leu Gln 35 40 45

Leu Arg Gly Asn Glu Ala Val Arg Leu Phe Leu Tyr Gln Arg Gly Tyr
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60
Gly Lys His Asn Pro Ilo Cly Val Phe Val Asn Gly Arg Gly Ala Re

Glu Lys His Asp Pro Ile Glu Val Phe Val Asn Gln Asp Gly Ala Tyr 65 70 75 80

Ser Ala Cys Leu Phe Asp Gly Glu Tyr Gln Leu Ile Thr Lys Ser Gly 85 90 95

Asn Gly Pro Trp Ser Glu Glu Gly Arg Asp Thr Ile Asn Val Ile Val 100 105 110

Ser Gly Asn Thr Val Gln Asn Val Glu Val Val Pro Tyr Tyr Met Val

115
120
125

Arg Asn Ala Glu Met Lys Leu Asn Gly Asn Val Val Thr Ala Ser Phe
130
135
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Asn Val Glu Lys Ile Ala Gly Lys Glu Ile Asp Arg Val Phe Phe Met 145 150 155 160

Leu Gly Thr Thr Gln Tyr Ile Asn Asp Gly Glu His Asn Val Asp Arg
165 170 175

Phe Asp Asp Ala Asp Gly Ala Lys Met Ala Glu Ile Asn Val Thr Gly
180 185 190

Ala Arg Tyr Glu Phe Thr Pro Arg Asp Tyr Thr Asp Asn Lys Met Phe 195 200 205

Gln Thr Ala Leu Lys Arg Gly Thr Leu Phe Gly Arg Ile Cys Ile Trp 210 215 220

Pro Lys Gly Ser Asp Gln Gly Ile Tyr Ser Glu Val Ile Arg Leu Lys 225 230 235 240

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Ala Phe Val Phe Val Ser Met Ala Asn Ala Lys Ala Asp Ile Pro Lys 20 25 30

Val Trp Glu Val Asn Gly Val Tyr Thr Leu Val Glu Val Glu Ser Pro 35 40 45

Ser Gly Tyr Gly Leu Ile Lys Ser Ile Thr Ile Gly Asn Glu Tyr Ala
50 55 60

Tyr Asn Ser Thr Glu Ile Lys Ile Val Val Ile Asp Gly Val Asn Ser

70 75 Val Arg Ile Asp Trp Val Ala Glu Gly Asn Arg Tyr Pro Val Thr Tyr 85 90 Ser Val Gly Tyr Asp Asn Thr Val Ile Ile Pro Asn Phe Leu Arg Arg 100 105 Arg Phe Ile Val Ser Val Glu Tyr Thr Phe Ala Gly Ser Met Ala Gly 120 Ile Gln Tyr Ala Tyr Glu Thr Arg Val Phe Glu Ile Arg Ser 135 <210> 5244 <211> 420 <212> PRT <213> B.fragilis <400> 5244 Glu Ile Pro Pro Phe Gly Gly Ile Phe Ser Ile Met Glu Lys Phe Gly Leu Met Leu Phe Thr Arg Asn Gly Leu Thr Leu Gly Lys Arg Cys Thr Ser Phe Phe Gly Tyr Gln Phe Arg Arg Ile Val Arg Ser Leu Met Ser Val Tyr Phe Cys Gly Gly Ser Cys Val Glu Asp Val Thr Ser Gln Leu 55 Met Arg His Leu Ser Tyr His Pro Thr Phe Arg Thr Cys Ser Ser Asp 70 Thr Ile Leu Arg Ala Ile Lys Glu Leu Thr Gln Glu Asn Ile Ser Tyr 90 Thr Ser Asp Gln Gly Lys Thr Tyr Asp Phe Asn Thr Ala Asp Lys Leu 100 105 Asn Thr Leu Leu Ile Asn Ala Leu Val Ser Thr Gly Glu Leu Lys Glu 120 Ile Glu Glu Tyr Asp Val Asp Phe Asp His Gln Phe Leu Glu Thr Glu 135 140 Lys Tyr Asp Ala Lys Pro Thr Tyr Lys Lys Phe Leu Gly Tyr Arg Pro 150 155 Gly Val Tyr Val Ile Gly Asp Lys Ile Val Tyr Ile Glu Asn Ser Asp 165 170 Gly Asn Thr Asn Val Arg Phe His Gln Ala Asp Thr His Lys Arg Phe 185 Phe Ala Leu Leu Glu Ser Gln Asn Ile Arg Val Asn Arg Phe Arg Ala 195 200 Asp Cys Gly Ser Cys Ser Lys Glu Ile Val Ser Glu Ile Glu Lys His 215 220 Cys Lys His Phe Tyr Ile Arg Ala Asn Arg Cys Ser Ser Leu Tyr Asn 230 235 Asp Ile Phe Ala Leu Arg Gly Trp Lys Thr Glu Glu Ile Asn Gly Ile 250 Gln Phe Glu Leu Asn Ser Ile Leu Val Glu Lys Trp Glu Gly Lys Cys 265 Tyr Arg Leu Val Ile Gln Arg Gln Arg Arg Asn Ser Gly Asp Leu Asp 275 280 Leu Trp Glu Gly Glu Tyr Thr Tyr Arg Cys Ile Leu Thr Asn Asp Tyr 295 Lys Ser Ser Thr Arg Asp Ile Val Glu Phe Tyr Asn Leu Arg Gly Gly 310 315 Lys Glu Arg Ile Phe Asp Asp Met Asn Asn Gly Phe Gly Trp Ser Arg 330 Leu Pro Lys Ser Phe Met Ala Glu Asn Thr Val Phe Leu Leu Leu Thr

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Ala	Leu	Ile 355	His	Asn	Phe	Tyr	Lys 360		Ile	Met	Ser	Arg 365		Asp	-
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Arg 385	Phe	Ile	Ser	Val	Pro 390	Ala	Lys	Trp	Ile	Met 395		Ala	Arg	Gln	
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65	Ala				70					75					
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	Arg Ser	115					120					125			
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_	Phe			165					170					175	
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Gln	Thr 290	275 Arg	His	Thr	Leu		280 Ser	Lys	Leu	Ser		285 Glu	Asp	Ile	,
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Phe	e Glu	Leu 355	Ser	Arg	Phe	Asp	Ser 360		Thr	Thr	Val	Asn 365		Tyr	Ile
Gly	7 Arg 370		Glu	Phe	Leu	Arg 375		Thr	Tyr	Pro	Gln 380		His	Leu	Ile
Arg 385	Lys	Leu	Tyr	Asn	Ile 390		Pro	Pro	Ala	Leu 395			Ala	Ala	Arg 400
Glr	ı Ala	Ser	Tyr	Glu 405		Arg	Leu	Ala	Arg 410	Ile	Asn	Ser	Leu	Asp 415	
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Glu	Ala	Arg 435	Lys	Ala	Met	Lys	Asp 440	Thr	Lys	Tyr	Arg	Asp 445	Ile	Val	Arg
Phe	Pro 450	Phe	Asn	Pro	Glu	Ala 455		Leu	Asp	Thr	Val 460	Ile	Tyr	Ala	Thr
Asp 465	Gln	Val	His	Phe	Leu 470	Tyr	Ser	Gln	Lys	Val 475	Pro	Ala	Asp	Glu	Asn 480
Ser	Ala	Arg	Met	Lys 485	Val	Tyr	Val	Val	Gly 490	Asp	Val	Leu	Asn	Ser 495	Asn
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	Ser	515					520					525			
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545					550					555					560
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Lys 705	Thr				710					715					720
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	Glu 770					775					780				_
Lys 785	Ala	Ala	Leu	Arg	Ile 790	Leu	Glu	Gln	Ser	Ser 795	Gln	Thr	Ala	Glu	Thr 800

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Gln Tyr Met Gln Ala Ile Leu Asn Ala Arg Leu Gly Asn Glu Gln Arg 805 810 Ala Val Ser Leu Leu Ser Ala Ala Glu Val Asp Asp Arg Ile Arg 825 Phe Arg Ala Asn Leu Asp Pro Glu Leu Ser Leu Leu Val Lys Lys Tyr 835 840 Gly Leu Phe Lys Glu Asp Asp Leu Trp <210> 5246 <211> 295 <212> PRT <213> B.fragilis <220> <221> UNSURE <222> (295) <223> Identity of amino acid sequences at the above locations are unknown. <400> 5246 Ala Ile Glu Arg Val Tyr Phe Gln Pro Arg Gly Glu Asp Leu Leu Lys Asn Asp Ala Leu Leu Pro Leu Asn Lys Glu Lys Ile Lys Ser Val Ala Val Val Gly Pro Phe Ala Asp Tyr Asn Tyr Leu Gly Gly Tyr Ser Gly 40 Gln Pro Pro Tyr Ser Val Ser Leu Leu Lys Gly Val Lys Glu Leu Ile Gly Lys Lys Gly Lys Val Thr Tyr Leu Asn Gly Met Gly Thr Ser Ala 70 Asp Ser Ile Ala Gln Val Val Lys Gly Ala Asp Ile Val Leu Val Ala 90 Leu Gly Ser Asp Glu Lys Met Ala Arg Glu Asn His Asp Met Pro Ser 105 Ile Tyr Leu Pro Glu Gly Gln Glu Lys Leu Leu Lys Glu Ile Tyr Gln 120 125 Val Asn Pro Arg Ile Val Leu Val Phe His Thr Gly Asn Pro Leu Thr 135 140 Ser Glu Trp Ala Asp Thr His Ile Pro Ala Ile Met Gln Ala Trp Tyr 150 155 Pro Gly Gln Glu Ala Gly Arg Ala Leu Ala Asn Leu Leu Phe Gly Asn 165 170 175 Glu Asn Pro Ser Gly Lys Leu Pro Met Thr Ile Tyr Arg Thr Glu Glu 185 Gln Leu Pro Asp Ile Leu Asp Phe Asp Met Trp Lys Gly Arg Thr Tyr 200 Arg Tyr Met Lys Gly Glu Pro Leu Tyr Gly Phe Gly His Gly Leu Ser 215 Tyr Thr Ser Phe Glu Phe Asp Asn Ile Gln Gly Asn Asp Thr Leu Gln 230 235 Pro Asp Ala Ile Leu Gln Cys Ser Val Glu Leu Ser Asn Ser Gly Gln 245 250 Leu Ala Gly Glu Glu Val Val Gln Val Tyr Val Ser Arg Glu Asn Thr 265 Pro Val Tyr Thr Tyr Pro Leu Lys Lys Leu Val Ala Phe Lys Lys Val 275 280 Lys Leu Ala Phe Ser Glu Xaa

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Leu Gly Phe Ile Gly Ser Thr Gly Asp Pro Lys Lys His Gly Ile Asp

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Leu	Asp	Val 195	Gln	Tyr	Gly	Lys	Gly 200	Thr	Tyr	Ser	Gln	Asp 205	Leu	Ile	His
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225					Pro 230					235					240
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	_	275			Tyr		280					285			
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Glu	Met	Thr	Gly	Thr 85	Glu	Val	Arg	Val	Ser 90	Asp	Lys	Glu	Lys	Ser 95	Ser
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	370					375					380			Leu	
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				405					410					415 Thr	
_			420					425					430	Thr	
		435					440					445		Ala	
	450					455					460			Cys	
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			500					505					510	Lys	
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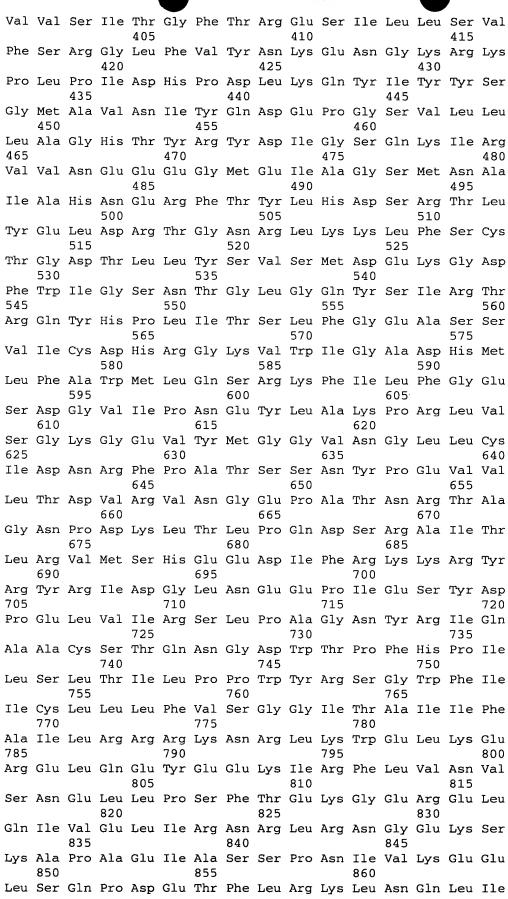
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Pro Val Thr Glu Glu Phe Arg His Asp Arg Ser Thr Trp Gly Asp Lys

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870 875 Thr Asp His Leu Asp Ser Pro Glu Leu Asp Val Thr Phe Leu Cys Thr 885 890 Glu Met Gly Leu Ser Arg Ala Ser Leu Tyr Asn Lys Leu Lys Ala Met 905 Thr Asn Met Gly Ala Asn Asp Tyr Ile Asn Lys Phe Arg Met Glu Lys 920 Ala Ile Gln Leu Ile Ser Thr Thr Asp Leu Thr Phe Thr Glu Ile Ala 935 Glu Lys Ile Gly Phe Thr Thr Ser Arg Tyr Phe Ser Thr Ser Phe Lys 950 955 Gln Tyr Thr Gly Glu Thr Pro Thr Gln Tyr Lys Glu Lys Ile Arg Lys 965 970 Ser Ser Lys Val 980 <210> 5253 <211> 786 <212> PRT <213> B.fragilis <400> 5253 Phe Leu Asn Glu Gln His Met Arg Lys Leu Phe Phe Pro Leu Leu Leu 10 Phe Val Ser Gly Leu Leu Ser Ala Gln Thr Glu Ile Thr Leu Tyr Val 25 Ser Pro Ser Gly Ser Asp His His Pro Gly Thr Ala Glu Lys Pro Met Ala Thr Leu Glu Tyr Ala Trp Lys Lys Ala Ser Arg Gln Ala Gly Arg 55 Arg Ser Ile Thr Ile Tyr Cys Glu Gly Thr Asn Tyr Leu Ser Ala Pro 75 Ile Leu Ile Thr Asn Glu Thr Ser Gly Thr Pro Glu His Pro Ile Arg 85 90 Phe Ser Ser Tyr Pro Gly Gln Lys Ala Val Ile Ser Gly Ser Arg Ile 105 Leu Arg Asn Leu Arg Trp Lys Glu Tyr Lys Asn Gly Ile Met Gln Ala 120 Lys Val Glu Glu Glu Leu Ile Pro Asp Gln Leu Phe Val Asn Gly Lys 140 Lys Gln Ile Ser Ala Arg Tyr Pro Asn Phe Asp Pro Asp Ile Arg Ile 150 155 Phe Asn Gly Tyr Ala Ala Asp Ala Cys Ser Pro Glu Arg Val Lys Asn 165 170 Trp Ser Asn Pro Ala Gly Gly Tyr Leu His Ala Met His Ser Arg Glu 185 190 Trp Gly Gly Tyr Gln Tyr Ser Ile Glu Gly Lys Asp Ala Lys Gly Glu 200 Leu Ile Leu Lys Gly Gly Phe Gln Asn Asn Arg Gln Met Gly Met His 215 220 His Thr Tyr His Met Val Glu Asn Ile Phe Glu Glu Leu Asp Ala Glu 230 235 Gly Glu Trp Tyr Phe Asp Lys Glu Thr His Thr Leu Tyr Phe Tyr Pro 245 250 Pro Arg Glu Leu Asp Leu Gln Thr Ala Leu Phe Glu Val Pro Gln Ala 265 Glu Asn Leu Phe Ile Leu Lys Gly Lys Thr Gly Ser Pro Val Arg His 280

Val Ser Val Asp His Leu Glu Leu Thr Gln Thr Leu Arg Thr Phe Met

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Lys Thr Asn Glu Pro Leu Leu Arg Ser Asp Trp Lys Ile Tyr Arg Gly Gly Ala Leu Ile Ile Glu Asn Ala Glu Lys Cys Ser Val Asn Gly Cys Tyr Leu His Asp Ile Gly Gly Asn Ala Ile Phe Phe Ser Asn Tyr Asn Arg Asn His Arg Val Ser Gln Asn His Ile Thr Arg Ile Gly Ala Ser Ala Val Cys Phe Val Gly Ser Pro Asp Ala Val Arg Ser Pro Leu Phe Glu Tyr Gly Lys Ser Gln Thr Trp Glu Gln Met Asp Lys Gly Thr Gly Pro Leu Thr Pro Asp Tyr Pro Ser Asp Cys Leu Val Asp Asp Asn Leu Ile His Ser Ile Gly Glu Thr Glu Lys Gln Gly Ala Gly Ile Gln Leu Ser Met Ser Ala Arg Ile Thr Ile Arg Asn Asn Ser Ile Tyr Asp Leu Pro Arg Ala Gly Ile Asn Val Ser Glu Gly Thr Trp Gly Gly His Leu Ile Glu Gly Asn Asp Val Phe Asp Thr Val Leu Glu Thr Gly Asp His Gly Ser Phe Asn Ser Trp Gly Arg Asp Arg Tyr Trp His Pro Asp Arg Asn Val Met Asp Glu Phe Ala Lys Glu His Pro Gln Met Val Phe Arg Asp Ala Thr Glu Thr Thr Val Ile Arg Asn Asn Arg Trp Arg Cys Asp His Gly Trp Asp Ile Asp Leu Asp Asp Gly Ser Ser Asn Tyr His Ile Tyr Asn Asn Leu Cys Leu His Gly Gly Leu Lys Leu Arg Glu Gly Phe Ala Arg Thr Val Glu Asn Asn Ile Met Val Asn Asn Thr Phe His Pro His Val Trp Phe Ala Asn Ser Gln Asp Ile Phe Arg His Asn Ile Val Thr Thr Pro Tyr Arg Pro Ile Gln Val Lys Glu Trp Gly Lys Glu Thr Asp Thr Asn Phe Phe Val Thr Lys Gln Gly Leu Glu Gln Ala Gln Lys Arg Gly Thr Asp Leu His Ser Leu Tyr Gly Asp Pro Leu Phe Ile Ala Pro Glu Lys Gly Asp Tyr Arg Val Lys Glu Asn Ser Pro Ala Leu Lys Thr Gly Phe Arg Asn Phe Asp Met Glu His Phe Gly Val Gln Cys Pro His Leu Lys Ala Leu Ala Ala Thr Pro Lys Leu Pro Val Phe Lys Ile Pro Glu Glu Lys Pro Glu Thr Val Gln Thr Tyr Ser Trp Lys Gly Leu Thr Leu Lys Glu Val Ser Thr Glu Gly Glu Arg Ser Ala Thr Gly Leu Asp Lys Ile Arg Gly Ile Leu Val Val Gln Val Glu Lys Gly Ile Thr Ala Leu Gln Ala Asn Asp Val Ile Leu Arg Ile Asn Gly Lys Pro Val Asp Asn Arg Thr Asp Met Glu Thr Glu Ile Arg Lys Ser Pro Glu Gly 

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Gln Lys His Gly Tyr Ile Thr Asn Leu Ile Thr Asp Asp Ala Ile Asp
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Trp Met Glu Asn Lys Arg Asp Glu Ser Lys Pro Phe Cys Leu Leu Ile
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Glu Gly Gln Arg Ala Ala Trp Asp Lys Phe Tyr Gly Pro Val Ile Asp
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 Gly Leu Ile Phe Pro Cys Val Glu Ile Thr Asp Phe Pro Arg Val Lys

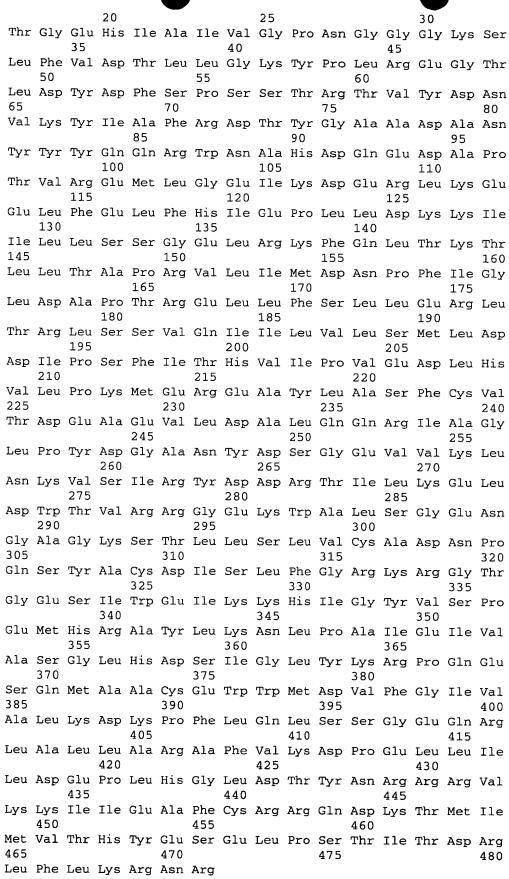
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<212> PRT

<213> B.fragilis

<400> 5258

Asn Arg Ile Met Glu Gln Tyr Thr Phe Asn Ile Ala Gly Gly Val Ala 10 Arg Asn Pro Leu Val Arg Leu Ala Gln Pro Val Thr Ala Gln Ile Ala



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<212> PRT

<213> B.fragilis

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Tyr Phe Glu Pro Ala Val Ala Ile Thr Asn Asn Asp Gly Asn Leu Ser

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	Thr	Glu	Thr	Tle	Tle			Lve	Δαη	λαν			Dro	17-1	7	Val
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	Thr	Len	Hic	Тул			Пъл	- Dro	Tre			77-7	<b>T</b> 1 -	<b>T</b>	175	Trp
		пси	1113	180		. Ата	туг	PIO			Asn	vaı	тте	_		Trp
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	Ser	GIU			птѕ	Gln	GIN			Pro	val	Val		Trp	Arg	Tyr
	7 J _	<b>G</b>	195		-	_	_,	200		_			205			
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	225	_	~ -	_	_	230					235					240
,	GIn	Pro	Gly	Lys	Lys	Ile	Leu	Asp	Thr	Lys	Leu	Gly	Ser	Arg	Ala	Ala
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	Met	His	Met	Gln	Pro	Phe	Phe	Glu	Leu	Gly	Leu	Glu	Gln	Pro	Ala	Gln
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,	Tyr	Gln	Phe	Thr	Phe	Glu	Val	Asp	Asn	Glu	Gly	Asp	Leu	Arg	Ile	Ile
		290					295					300				
]	Pro	Ala	Ile	Asn	Pro	Tyr	Ala	Ser	Asp	Tyr	Gln	Leu	Lys	Ala	Asn	Glu
	305					310					315					320
- 7	Thr	Phe	Thr	Thr	Pro	Glu	Phe	Ile	Phe	Thr	Leu	Ser	Asn	Asn	Gly	Thr
					325					330					335	
(	Gly	Glu	Ala	Ser	Arg	Asn	Leu	His	Asn	Trp	Ala	Arg	Asn	Tyr	Gln	Leu
				340					345					350		
I	Ĺуs	Asp	Gly	Lys	Gly	Asp	Arg	Met	Thr	Leu	Leu	Asn	Asn	Trp	Glu	Asn
			355					360					365			
7	Thr	Tyr	Phe	Thr	Phe	Asp	Glu	Glu	Leu	Leu	Gly	Lys	Leu	Met	Lvs	Glu
		370					375				_	380				
I	Ala	Lys	His	Leu	Gly	Val	Asp	Met	Phe	Leu	Leu	asA	Asp	Glv	Trp	Phe
3	385					390					395	-	•	_		400
C	Gly	Asn	Lys	His	Pro	Arg	Asn	Asp	Asp	His	Ala	Glv	Leu	Glv	Asp	Trp
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C	Glu	Ala	Met	Lys	Ser	Lys	Leu	Pro	Gly	Gly	Ile	Pro	Ala	Leu		Glu
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Thr Ser Trp Asn Ser Lys Thr Ser Val Lys Phe Arg Thr Asp Val Ala 615 620 Ser Met Cys Lys Leu Gly Phe Asp Ile Gly Leu Lys Asp Met Lys Ala 630 635 Asp Glu Leu Thr Tyr Cys Gln Glu Ala Val Ala Asn Tyr Lys Arg Leu 650 Lys Pro Val Ile Leu Asp Gly Asp Gln Tyr Arg Leu Val Ser Pro Tyr 665 Asp Gly Asn His Met Ala Val Met Tyr Thr Ala Pro Asp Ala Ser Lys 680 Ala Val Leu Phe Thr Tyr Asp Ile His Pro Arg Phe Gly Glu Lys Leu 695 700 Leu Pro Val Lys Leu Arg Gly Leu Asp Ala Gln Lys Met Tyr Arg Val 710 715 Lys Glu Ile Asn Leu Met Pro Gly Arg Lys Ser Asn Leu Ser Gly Asn 725 730

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Phe Thr Thr Ser Gln Thr Asn Ser Arg Val Ile Glu Leu Val Ala Glu 760

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<213> B.fragilis

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70 Ala Ala Leu Val Ser Ser Lys Thr Ile Ile Gly Lys Gln Tyr Ile

90 Leu Val His Lys Met Gly His Val Pro Phe Lys Leu Phe Thr Lys Ser

105 Gly Thr Tyr Leu Arg Asp Ile Gly Ser Phe Gly Gln Gly Ala Gly Glu 120

Tyr Gly Leu Ala Tyr Asp Ala Gln Met Asp Glu Glu Asn Asn Arg Leu 135 140

Tyr Val Leu Cys Trp Gln Ala Asp His Ile Leu Val Phe Asp Leu Gln 150 155

Gly Asn Ile Leu Gln Pro Ile Arg Leu Ala His Trp Ser Pro Lys Gly 165 170

Val Phe His Val Glu Thr Glu Arg Gly Arg Val His Val Cys Ala Leu 185 190

Ser Phe Asn Arg Asp Phe Val Gly Asp Arg His Ser Pro Met Ile Trp 200

Thr Gln Ser Leu Asp Gly Lys Ile Ile Lys Glu Leu Pro Ala Gly Tyr 220

Leu Ala Val Asn Asp Tyr Gly Asn Glu Ile Lys Ser Leu Asn Asn Gly 230 235

Thr Val Met Asp Ile Gly Phe Trp Phe Gly Gly Gln Tyr Arg Asn Asp 250

Ser Leu Tyr His Tyr Asn Asn Gln Glu Phe Arg Leu Leu Pro Arg Phe 265

260 Thr Leu Asp Tyr Gly Gly His Glu Leu Thr Pro His Ser Phe Gly Glu 280 Leu Pro Asn His Phe Trp Gly Glu Ile Ser Tyr Pro Val Arg Leu Ser 295 300 Pro His Ser Ser Thr Thr Pro Pro Glu Tyr Tyr Met Val Asp Lys 310 315 His Thr Leu Arg Gly Ala Phe Val Glu Ile Tyr Asn Asp Phe Leu Gly 325 330 Gly Ile Pro Ala Asp Trp Phe Phe Ser Ser His Asp Gly Tyr Tyr Val 345 Trp Asn Val Glu Pro Val Arg Leu Lys Gln Met Val Glu Asp Arg Leu 355 360 365 Ser Ser Gly Glu Ile Val Ser Asp Ser Asp Arg Arg Lys Leu Thr Glu 375 380 Leu Leu Arg Ser Thr Lys Glu Asn Asp Asn Asn Tyr Ile Phe Tyr Gly 390 395 Arg Leu Lys Cys Arg

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Arg Phe Cys Ile Gln Thr Leu Ile Asp Arg Asn His His Thr Asn Ala 180 185 His Thr Ser Ser Asp Asn Leu Ile Tyr Arg Tyr Val His His Ala Cys 200 Gln Phe Ile Ser Ser His Lys Phe Cys Gln Phe Gln Tyr Leu Ala Phe 215 220 Cys His Phe Leu Ile Phe Gln Phe Leu His Thr Val Gly Arg His Val

170

250

165

245

230 235 Thr Phe Phe Phe Thr Ile Phe Gly Thr Phe Val Leu Thr Phe Ala Cys 2111

Gln Thr Ser Gln Arg Phe Phe Asn Leu Leu Cys Tyr Ile Phe Phe Ala 265 Tyr Phe Leu Leu Tyr Tyr Arg Leu Phe Glu Ala Val Phe Ile Ile Val 280 Ile Thr Val Ser Ile Leu Ser Ala Ala Thr Leu Leu Ile Ser Ser Thr 295 Val Ile Ile Arg Thr Leu Thr Val Trp Ser Arg Val Cys Lys Ile Arg 310 315 Ser Asn Ile Val His Ile Tyr Phe Phe Leu Ile Ile Val Asp Ala Ile 330 Thr Phe Leu Leu Thr Val Arg Ile Lys Val Phe Leu Thr Asn Asp Leu 340 345 Ser Leu Phe Thr Ile Phe Phe Thr Asp Phe Leu Asp Asp Gly Phe Leu 360 365 His Leu Phe Leu Leu Ile Leu Thr Lys Leu Phe Leu Leu Phe Thr Leu 375 380 Phe Pro Leu Phe Leu Phe Arg Phe Leu Leu Arg Thr Cys Arg Leu Ile 390 395

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 Asp
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 Yal
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Thr Phe Phe Ser Ser Ala Ala Thr Gly Cys Gly Phe Gly Ser Ser Phe
115 120 125

Ile Gly Ser Phe Ser Thr Phe Arg Phe Ser Leu Ser Lys Ser Ile Phe

130 135 140

Pro Thr Gly Leu Asn Phe Gly Arg Thr Ser Ser Gly Met Thr Val Leu

145 150 160

The Gly Leu Ash Phe Gly Arg Thr Ser Ser Gly Met Thr Val Leu
145 150 155 160

The Thr Ser Ser Ala Thr Val Phe Ser Gly Ser Phe Leu Ser

170

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<211> 422

<212> PRT

<213> B.fragilis

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<400> 5265

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 Ile
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 Val
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 Arg
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 Val
 Ile
 Ala
 Lys
 Met
 Phe
 Gly
 Thr

40 Asp Glu Asn Tyr Asp Val Ile Val Asn Pro Asp Lys Gly Asp Phe Glu 55 Ile Trp Arg Asn Arg Glu Val Val Ala Asp Glu Asp Leu Thr Asn Pro 75 70 Asn Met Gln Ile Ser Leu Thr Glu Ala Gln Lys Ile Asp Ala Ser Tyr Glu Val Gly Glu Glu Val Thr Asp Glu Val Ile Phe Ala Lys Phe Gly 105 Arg Arg Ala Ile Leu Asn Leu Arg Gln Thr Leu Ala Ser Lys Ile Leu 120 Glu Leu Glu Lys Asp Ser Ile Tyr Asn Lys Tyr Ile Asp Lys Val Gly 135 Thr Ile Ile Asn Ala Glu Val Tyr Gln Ile Trp Lys Lys Glu Met Leu 150 155 Leu Leu Asp Asp Glu Gly Asn Glu Leu Leu Leu Pro Lys Thr Glu Gln 170 165 Ile Pro Ser Asp Phe Tyr Arg Lys Gly Glu Thr Ala Arg Ala Val Val 185 Ala Arg Val Asp Asn Lys Asn Asn Asn Pro Lys Ile Ile Leu Ser Arg 200 205 Thr Ser Pro Val Phe Leu Gln Arg Leu Phe Glu Met Glu Val Pro Glu 215 Ile Asn Asp Gly Leu Ile Thr Ile Lys Lys Ile Ala Arg Ile Pro Gly 235 230 Glu Arg Ala Lys Ile Ala Val Glu Ser Tyr Asp Asp Arg Ile Asp Pro 245 250 Val Gly Ala Cys Val Gly Val Lys Gly Ser Arg Ile His Gly Ile Val 265 260 Arg Glu Leu Arg Asn Glu Asn Ile Asp Val Ile Asn Tyr Thr Ser Asn 280 275 Ile Ser Leu Phe Ile Gln Arg Ala Leu Ser Pro Ala Lys Ile Ser Ser 300 295 Ile Arg Leu Asn Glu Glu Glu Arg Lys Ala Glu Val Phe Leu Lys Pro 315 310 Glu Glu Val Ser Leu Ala Ile Gly Lys Gly Gly Leu Asn Ile Lys Leu 330 325 Ala Ser Met Leu Thr Glu Tyr Thr Ile Asp Val Phe Arg Glu Leu Asp 345 Glu Asn Ala Gln Asp Glu Asp Ile Tyr Leu Asp Glu Phe Arg Asp Glu 360 Ile Asp Gly Trp Val Ile Asp Ala Ile Lys Ala Ile Gly Ile Asp Thr 375 Ala Lys Ser Val Leu Asn Ala Pro Arg Glu Met Leu Ile Glu Lys Thr 395 390 Asp Leu Glu Glu Glu Thr Val Asp Glu Val Leu Arg Ile Leu Lys Ser 410 405 Glu Phe Glu Asp Asn Glu 420 <210> 5266

<210> 5266 <211> 284

<212> PRT

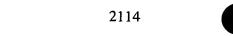
<213> B.fragilis

<400> 5266

Leu Pro Phe Tyr Tyr Tyr Ala Asp Gly Arg Lys Phe His Ile Thr Met
1 5 10 15
Val Gly Arg Gly Tyr Phe Trp Lys Arg Ile Asp Asn Glu Ile Ile Asp

4...18 4...18 11 4...18 11 4...18 4...18 4...18 4...18 4...18 4...18 4...18 4...18 4...18

20 25 Lys Ile Met Leu Glu Ile Lys Asp Leu His Ala Ser Ile Asn Gly Lys 40 Glu Ile Leu Lys Gly Ile Asn Leu Thr Val Lys Pro Gly Glu Val His Ala Ile Met Gly Pro Asn Gly Ser Gly Lys Ser Thr Leu Ser Ser Val 75 Leu Val Gly Asn Pro Ala Phe Glu Val Thr Lys Gly Ser Ile Thr Phe 90 Tyr Gly Lys Asn Leu Leu Glu Leu Ser Pro Glu Asp Arg Ser His Glu 105 Gly Ile Phe Leu Ser Phe Gln Tyr Pro Val Glu Ile Pro Gly Val Ser 120 Met Val Asn Phe Met Arg Ala Ala Val Asn Glu Gln Arg Lys Tyr Lys 135 140 Gly Leu Pro Ala Leu Thr Ala Ser Glu Phe Leu Lys Leu Met Arg Glu 150 155 Lys Arg Ala Val Val Glu Leu Asp Asn Lys Leu Ala Asn Arg Ser Val 170 Asn Glu Gly Phe Ser Gly Gly Glu Lys Lys Arg Asn Glu Ile Phe Gln 180 185 Met Ala Met Leu Glu Pro Arg Leu Ser Ile Leu Asp Glu Thr Asp Ser 200 Gly Leu Asp Ile Asp Ala Leu Arg Ile Val Ala Glu Gly Val Asn Lys 215 Leu Lys Thr Pro Asp Thr Ser Cys Ile Val Ile Thr His Tyr Gln Arg 230 235 Leu Leu Asp Tyr Ile Lys Pro Asp Ile Val His Val Leu Tyr Lys Gly 245 250 Arg Ile Val Lys Thr Ala Gly Pro Glu Leu Ala Leu Glu Leu Glu Glu 260 265 Lys Gly Tyr Asp Trp Ile Lys Lys Glu Leu Gly Glu 275 280 <210> 5267 <211> 64 <212> PRT <213> B.fragilis <400> 5267 Leu Trp Gly Tyr Trp Gln Gln Lys Pro Leu Tyr Thr Ser Leu Ala Val Lys Leu Cys Pro Thr Val Thr Asp Ser Met Thr Val Ala Gln Ile Leu 25 Ala Phe Ile Ile Irp Ile Ala Val Ala Ala Asn Leu Tyr Ile Gly 40 Gly Phe Ser Ile Asn Gln Gly Ile Gly Gly Gly Phe Thr Trp Leu Ala 50 <210> 5268 <211> 115 <212> PRT <213> B.fragilis <400> 5268 Tyr Lys Pro Leu Asn Glu Thr Arg Ile Met Leu Leu Ala Thr Thr Pro 10 Ile Ile Glu Gly Lys Arg Ile Thr Thr Tyr Tyr Gly Ile Val Ser Gly 20



Phe Leu Glu 115

<210> 5269

<211> 553

<212> PRT

<213> B.fragilis

<400> 5269

Thr Leu Gln Lys Gln His Leu Met Lys Lys Lys Lys Val Thr Tyr 20 25 30

Cys Cys Leu Leu Leu Leu Ala Ser Phe Phe Thr Thr Val Thr Ala Gln 35 40 45

Asn Thr Asn Thr Pro Met Met Gly Trp Ser Ser Trp Asn Thr Phe Arg
50 55 60

Val His Ile Asn Glu Glu Leu Ile Lys Glu Thr Ala Asp Ala Met Val 65 70 75 80 Asn Arg Gly Leu Lys Asp Val Gly Tyr Gly Tyr Val Asn Ile Asp Asp

85 90 95
Gly Tyr Phe Gly Gly Arg Asn Ser Glu Gly Arg Leu Phe Ala Asn Lys

100 105 110 Lys Lys Phe Pro Asn Gly Met Arg Val Leu Ser Asp Tyr Ile His Ser

\$115\$ \$120\$ \$125\$ Lys Gly Leu Lys Ala Gly Ile Tyr Ser Asp Ala Gly Ser Asn Thr Cys

130 135 140

Gly Ser Ile Tyr Asp Ala Asp Thr Leu Gly Ile Gly Val Gly Leu Trp
145 150 155 160

Lys His Asp Asp Ile Asp Cys Gln Thr Phe Leu Lys Asp Trp Gly Tyr
165 170 175

Asp Phe Ile Lys Ile Asp Trp Cys Gly Gly Glu Ala Thr Gly Gln Ser 180 185 190

Glu Gln Gln Arg Tyr Thr Asp Ile Tyr Lys Ala Ile Arg Arg Thr Gly
195 200 205

Arg Thr Asp Val Arg Tyr Asn Ile Cys Arg Trp Gln Phe Pro Gly Thr 210 215 220

Trp Ala Thr Gln Leu Ala Gly Ser Trp Arg Ile His Thr Asp Ile Asn 225 230 235 240

Pro Arg Phe Thr Thr Ile Asp Arg Ile Ile Glu Arg Asn Leu Tyr Leu 245 250 255

Ala Pro Tyr Ala Ser Pro Gly His Tyr Asn Asp Met Asp Met Leu Glu 260 265 270

Val Gly Arg Gly Leu Thr Glu Asp Glu Glu Lys Thr His Phe Gly Ile 275 280 285

Trp Ser Ile Leu Ser Ser Pro Leu Met Ile Gly Cys Asp Leu Arg Thr 290 295 300

Ile Pro Glu Lys Thr Leu Ser Ile Ile Thr Asn Lys Glu Val Ile Ala 305 310 315 320

Leu Asn Gln Asp Ser Leu Gly Leu Gln Ala Glu Ala Ile Glu Arg Gly 325 330 Lys Asp Tyr Leu Ile Leu Ser Lys Ala Ile Gln Lys Arg Glu Gly Lys 345 Leu Arg Ala Val Ala Leu Tyr Asn Arg Ser Asn Thr Asp Gln Gln Ile 360 Arg Val Asp Phe Asp Lys Leu Tyr Leu Ser Gly Asp Val Arg Val Arg 375 380 Asp Leu Trp Asn His Gln Glu Met Gly Thr Phe Thr Asp Tyr Tyr Glu 390 395 Thr Leu Val Pro Ala His Gly Thr Ala Leu Ile Arg Leu Glu Gly Ser 410 Lys Arg His Asp Arg Thr Cys Tyr Glu Ala Glu Tyr Ala Phe Met Gln 420 425 Glu Phe Leu Pro Asp Asn Lys Gln Ala Ala His Phe Thr Pro Lys Ser 440 445 Gly Ala Ser Gly Glu Tyr Ile Met Lys Asn Leu Gly Asn Ser Pro Ser 455 Asn Trp Ala Glu Phe Arg Asn Val Tyr Ile Ser Lys Gly Gly Asp Tyr 470 475 Gln Leu Lys Leu Thr Tyr Tyr Ser Gly Asp Lys Arg Asp Ile Gln Ile 485 490 Ala Val Asn Gly Thr Glu Tyr Lys Gln Ser Asn Leu Tyr Ser Gly Thr 500 505 Trp Asp Gln Ala Ala Thr Thr Ile Lys Val Lys Leu Arg Lys Gly 515 520 Tyr Asn Thr Ile Arg Leu Tyr Asn Ser Tyr Gly Trp Ala Pro Asp Ile 535 Asp Lys Met Glu Ile Ile Lys Gly Arg 550 <210> 5270 <211> 449 <212> PRT <213> B.fragilis <400> 5270 Ile Thr Arg Gln Phe Met Lys Asn Thr Asn Arg Ser Ile Leu His Lys Asp Gly Val Ser Tyr Ile Leu Pro Phe Ile Leu Val Thr Ser Cys Phe 25 Ala Leu Trp Gly Phe Ala Asn Asp Ile Thr Asn Pro Met Val Lys Ala 40 Phe Ser Lys Ile Phe Arg Met Ser Val Thr Asp Gly Ala Leu Val Gln 55 Val Ala Phe Tyr Gly Gly Tyr Phe Ala Met Ala Phe Pro Ala Ala Met Phe Ile Arg Lys Tyr Ser Tyr Lys Ala Gly Ile Leu Leu Gly Leu Gly 90 Leu Tyr Ala Leu Gly Ala Leu Leu Phe Phe Pro Ala Lys Met Thr Gly 105 Asp Tyr Tyr Pro Phe Leu Leu Ala Tyr Phe Ile Leu Thr Cys Gly Leu 120 125 Ser Phe Leu Glu Thr Ser Ala Asn Pro Tyr Ile Leu Ser Met Gly Thr 135 Glu Glu Thr Ala Thr Arg Arg Leu Asn Leu Ala Gln Ser Phe Asn Pro 150 155 Met Gly Ser Leu Leu Gly Met Tyr Val Ala Met Asn Phe Ile Gln Ala 165 170

Arg Leu Asn Pro Met Asp Thr Val Glu Arg Ser Gln Leu Ser Pro Ala 185 Glu Phe Glu Val Leu Lys Glu Ser Asp Leu Ser Val Leu Ile Ala Pro 200 Tyr Leu Ile Ile Gly Leu Val Ile Leu Ala Met Leu Phe Val Ile Arg 220 Ala Val Lys Met Pro Lys Asn Gly Asp Lys Asn His Asn Ile Asp Phe 230 235 Ile Pro Thr Leu Lys Arg Ile Phe Lys Ile Pro His Tyr Arg Glu Gly 245 250 Val Ile Ala Gln Phe Phe Tyr Val Gly Ala Gln Ile Met Cys Trp Thr 265 Phe Val Ile Gln Tyr Gly Thr Arg Leu Phe Met Ser Gln Gly Met Glu 280 285 Glu Lys Ala Ala Glu Val Leu Ser Gln Glu Tyr Asn Ile Ile Ala Met 295 300 Ile Ile Phe Cys Ile Ser Pro Phe Arg Val Tyr Ile Tyr Ser Ser Leu 310 315 Pro Glu Ser Gly Asp Ala Ser Gln Asp Ser Cys Asp Cys Gly Trp Cys 325 330 Phe Tyr Val Arg Cys Asp Phe Phe Ala Arg His Met Gly Ile Val Leu 345 Phe Ser Ser Cys Phe Gly Leu Tyr Val Thr Asn Val Ser His Asp Leu 360 Trp Pro Leu Leu Phe Val Val Trp Val Met Met Pro Asn Leu Gly Ala 375 Ala Gly Leu Ile Met Ala Ile Leu Gly Gly Ser Val Leu Pro Pro Leu 390 395 Gln Ala Cys Ile Ile Asp Gln His Thr Leu Leu Gly Met Pro Ala Val 405 410 Asn Leu Ser Phe Ile Leu Pro Phe Ile Cys Phe Val Val Ile Ile Ile 425 Tyr Gly His Arg Thr Cys Ala Arg Val Lys Lys Ile Lys Ala Ala Arg 440 Lys <210> 5271 <211> 573 <212> PRT <213> B.fragilis

<400> 5271

115

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<210> 5272 <211> 555

<212> PRT <213> B.fragilis

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410

Asp Tyr Met Phe Lys Asp Tyr Ser Met Asn Gln Ser Ala Asn Leu Asn 420 425 430 Val Met Gly Gly Thr Lys Lys Val Asp Tyr Phe Ile Ser Ala Ser Ile

405

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435
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                                                 445
 Asn Asn Asp Asn Gly Met Leu Lys Lys Asp Pro Asn Asn Thr Phe Asp
                         455
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Asn Asn Ile Gln Asn Leu Arg Tyr Ser Phe Gln Ser Asn Val Gly Ala
                     470
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Trp Leu Thr Ser Ser Thr Lys Val Asn Val Arg Ile Asn Ser Gln Ile
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Val Asn Tyr Asn Gly Pro Ser Thr Ser Met Asp Asp Leu Tyr Lys Tyr
                                 505
Val Met Glu Ala Pro Ser Met Tyr Phe Ala Pro Val Tyr Pro Asn Ile
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Asn Arg Glu Asp His Thr Ile Phe Gly Asn Lys Ser Gly Gly Pro Ile
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Gly Ser Glu Gly Phe Ser Ile Tyr Arg Asn Pro
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Val Thr Ile Thr Leu Tyr Met Asn Asn Ile Glu Tyr Ile Ser Lys
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Ile Lys Lys Gly Glu Glu Thr Ser Phe Arg His Phe Val Asn Ser Tyr
                            40
Ser Lys Asp Leu Phe Tyr Tyr Ala Gln Cys Phe Val Arg Ser Lys Glu
                        55
Thr Ala Glu Glu Val Val Ser Asp Val Phe Leu Asp Val Trp Arg His
                    70
                                        75
Arg Glu Glu Ile Asp Glu Ile Lys Asn Ile Lys Ala Trp Leu Leu Thr
                85
                                     90
Leu Thr His Asn Lys Ala Ile Phe Tyr Leu Arg Lys Ala Glu Asn Ser
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Ser Glu Ile Ala Ser Trp Glu Glu Ile Asp Asp Phe Gln Ile Ile Gly
Asn Leu Gln Leu Pro Met Lys Arg
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Ser Leu His Ser Cys Asp Tyr Leu Asp Ile Val Pro Asp Asp Thr Pro
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Ile Leu Ala Asp Ala Phe Lys Asn Glu Gln Thr Ala Glu Asn Phe Val
Phe Ala Cys Tyr Ser Phe Ile Pro Asn Tyr Leu Asn Phe Arg Gln Asn
Phe Ser Trp Cys Thr Thr Pro Glu Thr Val Gly Ser Ala His Trp Thr
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Thr Thr Trp Phe Thr Phe Met Arg Met Gln Gln Gly Leu Tyr Asn Ser
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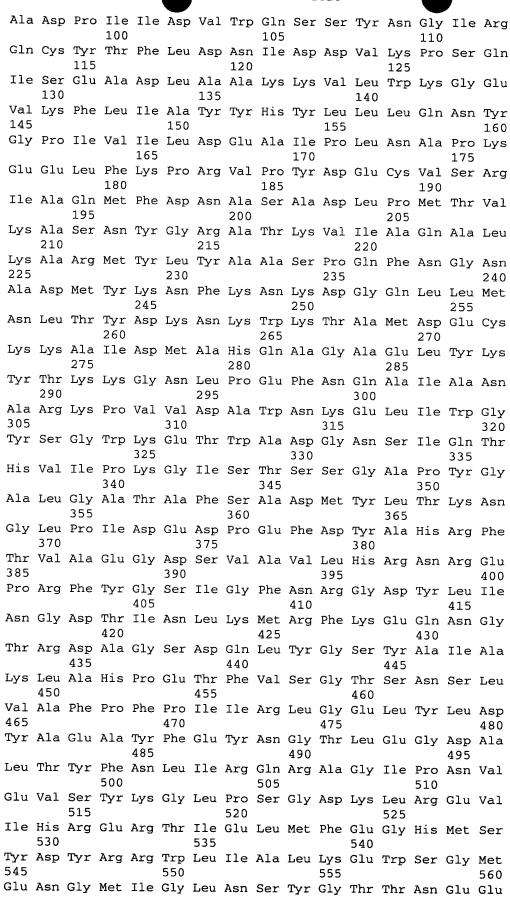
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565
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Tyr Tyr Lys Asn Ala Arg Leu Asp Ala Gln Pro Phe Ile Phe Arg Asp
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Glu Gln Tyr Leu Ser Pro Ile Lys Gln Asp Tyr Leu Asn Val Asn Ser
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Asn Leu Val Gln Asn Pro Gly Trp
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Leu Pro Leu Val Asp Gly Gly Lys Thr Asp Leu Leu Pro Lys Lys Val
                            40
Lys Asp Arg Ala Leu Lys Ser Phe Asn Thr Phe Gln Gln Ala Pro Ile
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Lys His Lys Lys Met Ser Gln Lys Gln Gln Leu Ser Arg His Phe Asn
Ile Cys Gln Asn Thr His Ala Ser Glu His Leu Thr Asp Pro Phe Asp
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Thr Ser Tyr Lys Ser Ile Asn Phe Leu Phe Cys Ile Ile His Gly Lys
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Leu Leu Gly Asn Cys Phe Leu Leu Val Ser Leu Ala Ser Cys Gly
Lys Val Ser Leu Ala Glu Glu Ala Val Phe Ser Ile Pro Val Asp Thr
Thr Phe Met Arg Leu Arg Gln Trp Glu Trp Tyr Cys Gln Lys Arg Ala
                       55
Asp Ser Cys Leu Thr Glu Asn Asn Tyr Gln Gly Ala Leu Ser Trp Leu
                                        75
Asp Ser Ala Arg Ile Gln Val Glu His Tyr Gly Arg Pro Tyr Tyr Ile
               85
                                    90
Leu Ala Arg Gly Asp Val Tyr Tyr Ser Ile His Gln Tyr Asp Ser Ala
                                105
Arg Arg Tyr Phe Ser Met Ala Val His Ser Ile His Pro His Ile Ala
                           120
                                                125
Ile Glu Ala Trp Arg Lys Leu Ala Glu Leu Glu Leu Met Glu Gly Asn
                       135
Glu Lys Gln Gly Phe Tyr Ser Thr Gln Lys Ala Asp Ala Leu Phe Arg
                   150
                                        155
Val Glu Ile Gly His Val Gln Ser Asp Asn Ser Glu Ala Leu Tyr Gln
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Glu Glu Arg Leu Lys Asn Glu Leu Asn Gln Leu Lys Ile Ala Lys Gln
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Asn Arg Glu Ile Ala Met Leu Thr Leu Ser Leu Cys Leu Ile Ile Leu
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Ile Ala Leu Phe Ile Phe Tyr Arg Gln Asn Lys Ile Lys Arg Glu Lys
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Glu Arg Leu Leu Glu Glu Lys Ala Lys Leu Glu Gln Glu Asn Gln
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Ile Leu Lys Gln Thr Glu Glu Leu Ser Ala Leu Arg Glu Lys Glu Ala
Val Leu Arg Glu Ser Leu Phe Arg Lys Val Asp Val Leu Arg Lys Ile
                               265
Pro Ser Leu Asn Glu Glu Glu Glu Ser Gly Glu His Arg Ile Ala
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Leu Ser Glu Arg Glu Trp Glu Glu Ile Arg Gln Thr Val Asp Asn Ala
                        295
                                           300
Tyr Asp Gly Phe Ser Gln Arg Leu Leu Ala Arg Phe Pro Leu Leu Thr
                    310
                                        315
Leu Lys Asp Ile Tyr Phe Cys Cys Leu Val Lys Ile Asn Val Ser Ile
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Lys Asp Leu Ser Asp Ile Tyr Cys Ile Ser Arg Thr Ser Val Ser Lys
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Lys Lys Phe Arg Ile Lys Arg Glu Lys Leu Gly Ala Glu Asp Ser Asp
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Ser Leu Asp Asp Phe Leu Arg Gly Phe
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Lys Ile Val Val Glu Ile Asp His Ala Glu Gly Val Trp Ile Glu Asp
                            40
Cys Val Glu Leu Ser Arg Phe Ile Glu Ser Lys Leu Asn Arg Glu Glu
                        55
Glu Asp Tyr Glu Leu Glu Val Arg Ser Ala Gly Xaa Arg Gln Pro Phe
                                        75
Lys Val Leu Gln Gln Tyr Tyr Asn His Ile Gly Leu Glu Val Glu Val
                                    90
Leu Thr Lys Gly Gly Arg Lys Leu Ser Gly Val Leu Lys Asp Ala Asp
                               105
Glu Glu Lys Phe Val Val Thr Val Gln Lys Lys Val Lys Pro Glu Gly
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Ala Lys Arg Pro Gln Leu Val Glu Glu Asp Glu Thr Phe Thr Tyr Asp
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Asp Ile Lys Tyr Thr Lys Tyr Leu Ile Ser Phe Lys
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<212> PRT <213> B.fragilis

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440 445 Asp Ile His Asn Glu Thr Ala Val Val Glu His Glu Ala Thr Thr Ser 455 460 Lys Ile Ser Glu Asp Gln Ile Phe Tyr Cys Asn Gln Arg Gly Ile Ser 470 475 Thr Glu Asp Ala Ile Gly Leu Ile Val Asn Gly Tyr Ala Lys Glu Val 490 Leu Asn Lys Leu Pro Met Glu Phe Ala Val Glu Ala Gln Lys Leu Leu 500 505 Thr Ile Ser Leu Glu Gly Ser Val Gly <210> 5279 <211> 81 <212> PRT <213> B.fragilis <400> 5279 Pro Arg His Trp Arg Arg Phe His Leu Ala Gly Leu Asn Arg Met Leu 10 Glu Ala Gly Leu Gly Ala Leu Lys Tyr Leu Leu Val Ser Leu Val 25 Ile Cys Val Ile Gln Phe Ile Asp Ser Asp Ser Gln Leu Ile Ser Gln 40 Thr Lys Lys Glu Gln Ser Leu Leu Tyr Tyr Leu Met Glu Ser Phe Ala 55 Gly Ile Phe Phe Pro Ala Ala Lys Glu Val Thr Gln Gln Tyr Ile Phe Lys <210> 5280 <211> 446 <212> PRT <213> B.fragilis <400> 5280 Leu Phe Thr Trp Phe Leu Val Leu Gly Asn Leu Phe Val His Ala Asn 10 Leu Arg Asn Ile Leu Tyr Asn Met Leu Ile Tyr Ser Val Val Ser Tyr 25 Phe Phe Leu Lys Tyr Phe Val Tyr Ile Pro Phe Cys Phe Ser Ser Ala 40 Arg Trp Leu Ile Leu Gln Tyr Gln Asn Phe Lys Asn Val Arg Asp Met 55 Leu Asn Arg Leu Asn Tyr Phe Ile Met Leu Ala Gly Leu Leu Val Leu 70 75 Val Ala Cys Ser Ser Asn Ser Gly Lys Gln Val Glu Val Ala Asn Thr 85 90 Pro Phe Val Tyr Asp Gly Leu Lys Glu Tyr Pro Val Lys Glu Leu Lys 105 Leu Ser Asp Leu Ala Val Ser Asp Tyr Val Leu Leu Lys Asp Asp Glu 120 Asn Ser Leu Leu Gly Arg Leu Pro Thr Asn Pro Cys Met Gln Val Thr Glu Asp Arg Ile Tyr Ile Gln Asp Glu Glu Gln Gln Ala Ile Phe Ile 150 155 Phe Asp Arg Gln Gly Asn Pro Leu Leu Gln Met Arg His Lys Gly Gly 165

2125

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Gly Pro Gln Glu Trp Ala Ser Leu Asn Ser Phe Tyr Val Asp Ser Pro
                               185
Asn Lys Glu Ile Ile Val Leu Asp Trp Ala Lys Lys Phe Ile Val Tyr
                            200
Asp Leu Asn Gly Lys Phe Lys Arg Ser Phe Pro Thr Pro Gly Cys Ser
                       215
Trp Lys Phe Ala Asn Leu Asn Asp Glu Ala Val Leu Ile Tyr Cys Pro
                   230
                                        235
Phe Thr Asn Arg Asn Asn Gly Glu Ala Val Cys Ile Leu Ser Lys Lys
               245
                                   250
Asp Gly Lys Lys Leu Tyr Val Cys Pro Ile Thr Ile Asp Asn Phe Val
                               265
Trp Asp Ser Glu Gly Arg Ile Gly Tyr Glu Pro Leu Lys Pro Ala Tyr
                          280
Gly Gly Ile Leu Phe Ser Asp Leu Ser Leu Lys Gly Val Tyr Phe Ile
                       295
                                           300
Asp Ala Glu Thr Tyr Glu Val Lys Gln Val Ile Asp Glu Val Thr Glu
                   310
                                       315
Tyr Lys Phe Glu Asn Ala Glu Phe Val Lys Leu His Pro Ala Ile Asp
               325
                                   330
Ala Lys Asp Tyr Thr Leu Tyr Thr Thr Leu Gly Thr Lys Trp Leu Thr
                               345
Pro Asp Met Pro Met Asn Tyr Tyr Tyr Phe Asp Lys Lys Glu Gln Lys
                           360
Met Tyr Thr Leu Lys Asn Glu Thr Gly Trp Ala Val Leu Lys Asp Ile
                       375
Cys Asn Val Gln Arg Thr Arg Thr Thr Asn Thr Pro Gly Ile Gly Ile
                   390
                                       395
Gly Tyr Tyr Trp Pro Ser Thr Met Lys Gly Glu Ser Met Gln Ala Glu
               405
                                  410
Lys Glu Gln Phe Asp Ser Arg Phe Arg Ala Ile Met Asp Ser Ile Pro
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Glu Glu Gly Asn Pro Val Leu Gln Ile Met Asn Phe Asn Lys
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100 105 110 Ile Thr Lys Gly Ala Trp Glu Met Ser Asp Met Phe Glu Ile Lys Ala 120 Ile Glu Met Ile Asn Arg Tyr Leu Val Thr Ala Val Glu Glu Pro Ser 135 Asn Ala Glu Ala Arg Asn Gly Met Ala Val Ala Gln Tyr Ile Ala Gly 150 155 Met Ala Phe Ser Asn Val Gly Leu Gly Val Val His Gly Met Ala His 165 170 Pro Leu Gly Ala Ile Phe Asp Ile Pro His Gly Val Ala Asn Ala Leu 185 Leu Leu Pro Ile Ile Met Glu Phe Asn Ala Pro Ala Ala Leu Asp Lys 200 Tyr Val Glu Ile Ala Lys Ala Met Asn Val Tyr Ser Thr Asp Met Thr 215 220 Lys Glu Lys Ala Ala Glu Ala Val Glu Ala Val Lys Thr Leu Ser 230 235 Leu Arg Val Asn Ile Pro Gln His Leu Ser Asp Leu Gly Ile Gln Glu 245 250 Ser Asp Leu Asp Arg Leu Ala Thr Ala Ala Phe Ala Asp Val Cys Thr 2.60 Pro Gly Asn Pro Arg Glu Val Thr Lys Glu Ile Ile Leu Asp Leu Tyr 275 280 Lys Lys Ala Leu 290 <210> 5285 <211> 215 <212> PRT <213> B.fragilis <400> 5285 Glu Ser Ile Met Ile Thr Asn Glu His Ile Glu Gln Tyr Leu Ala Gln Ala His Arg Tyr Gly Asp Ala Lys Leu Met Leu Arg Ser Ser Gly Asn 25 Leu Ser Trp Arg Ile Gly Glu Glu Ala Leu Val Ser Gly Thr Gly Ser Trp Val Pro Asn Leu Gln Lys Glu Lys Val Ser Ile Cys Asn Ile Ala 55 Thr Gly Thr Pro Gln Asn Gly Val Lys Pro Ser Met Glu Ser Thr Phe 70 75 His Leu Gly Ile Leu Arg Glu Arg Pro Asp Val Asn Val Val Leu His 90 Phe Gln Ser Glu Tyr Ala Thr Ala Val Ser Cys Met Lys Asn Lys Pro 105 Ser Asn Phe Asn Val Thr Ala Glu Ile Pro Cys His Val Arg Lys Glu 120 125 Ile Pro Ile Ile Pro Tyr Tyr Arg Pro Gly Ser Pro Ala Leu Ala Lys 135 140 Ala Val Val Glu Ala Met Lys Glu His Asn Ser Val Leu Leu Thr Asn 155 His Gly Gln Val Val Cys Gly Lys Asp Phe Asp Gln Val Tyr Glu Arg 170 Ala Thr Phe Phe Glu Met Ala Cys Arg Ile Ile Val Gln Ser Gly Gly 185 Asp Tyr Ser Val Leu Thr Pro Glu Glu Ile Asp Asp Leu Glu Val Tyr 200 Val Leu Gly Lys Lys Thr Lys

215

<210> 5286 <211> 388 13 Į,fj = E3 G TU. C 1 111 O D

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<212> PRT <213> B.fragilis <400> 5286 Cys Asn Pro Ile Lys Ile Met Arg Lys Asn Lys Phe Lys Ser Phe Ala Ser Arg Leu Asn Lys Asp Gly Asp His Pro Glu Lys Ile Ser Phe Glu 25 Ser Pro Glu Glu Gln Ala Glu Tyr Asp Lys Leu Asp Phe Leu Trp Asn 40 Arg Cys Leu Pro Glu Glu Thr Gly Glu Pro Asp Ile Trp Ala Lys Val 55 Gln Ala Lys Ile Asn Ala Asp Asn Thr Pro Val Arg Leu Ala Leu Lys 70 75 Ser Asn Lys Thr Ala Arg Leu Phe Ser Ile Leu Lys Tyr Ser Ala Val Ala Ala Ser Val Ala Leu Leu Ile Gly Ala Gly Cys Phe Leu Leu 100 105 Asn Asp Glu Glu Arg His Asp Leu Asn Lys Ile Ala Gln Ser Leu Gln 120 Thr Glu Ile Pro Gln Asp Ile Lys Glu Val Thr Leu Val Val Ser Asp 135 140 Gln Lys Lys Ile Glu Leu Asp Asn Asn Ala Gln Ile Val Tyr Ser Ala 150 155 Thr Gly Gln Val Gln Val Asn Ser Asn Lys Leu Val Glu Asp Asp Ile 165 170 Lys Glu Glu Tyr Asn Gln Ile Ile Val Pro Lys Gly Lys Arg Ser Gln 185 Ile Val Leu Ala Asp Asn Ser Lys Ile Trp Ile Asn Ser Gly Ser Lys 200 Val Ile Tyr Pro Arg Ala Phe Glu Gly Lys Tyr Arg Glu Ile Tyr Val 215 220 Glu Gly Glu Val Tyr Leu Asn Val Thr His Asp Thr Ser Lys Pro Phe 230 235 Ile Val Asn Thr Ser Gly Phe Glu Val Arg Val Leu Gly Thr Ser Phe 245 250 Asn Ile Ser Ala Tyr Lys Asn Gln Glu Lys Ala Ala Val Val Leu Val 265 Glu Gly Ser Val Asn Val Lys Asp Gln Gln Asn His His Ile Lys Met 280 Val Pro Asn Glu Lys Val Glu Leu Asn Gln Glu Gly Ile Ser Gly Lys 295 300 Glu Lys Val Asn Ala Arg Asp Tyr Ile Ser Trp Ile Asp Gly Ile Trp 310 315 Thr Leu Gln Gly Glu Ser Leu Lys Gln Val Leu Leu Arg Leu Gln Asn 325 330 Tyr Tyr Gly Gln Asn Ile Arg Cys Asp Ala Ala Ile Glu Asn Glu Gln 340 345 Met Phe Gly Lys Leu Phe Leu Asn Asp Asp Leu Asn Gln Val Met Lys 360 Ser Ile Leu Ser Ile Leu Pro Ala Glu Tyr Thr Met Lys Asn Asn Val 375 Ile Tyr Ile Glu

<210> 5287 <211> 488 <212> PRT <213> B.fragilis

<400> 5287

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420 425 430 Gln Leu Thr Ala Asn Ala Leu Gly Ile Pro Val Tyr Ala Gly Pro Val 440 445 Glu Ala Thr Ala Ile Gly Asn Ile Leu Val Gln Ala Lys Ala Gln Gly 455 Glu Val Asp Ser Trp Glu Glu Leu Lys Glu Ile Ile Ile Asn Ser Val 470 475 Glu Pro Gln Val Tyr Tyr Pro Glu 485

<210> 5288 <211> 1016 <212> PRT <213> B.fragilis

<400> 5288 Asn Met Thr Ile Arg Leu Asn Lys Val Thr Arg Asp Leu Asn Val Gly Ile Ala Thr Val Val Glu Phe Leu Gln Lys Lys Gly Tyr Thr Val Glu 2.5 Ala Asn Pro Asn Thr Lys Ile Thr Glu Glu Gln Tyr Ala Met Leu Val 40 Lys Glu Phe Ser Thr Asp Lys Asn Leu Arg Leu Glu Ser Glu Arg Phe 55 Ile Gln Glu Arg Gln Asn Lys Asp Arg Asn Lys Ala Ser Val Ser Ile 70 Asp Gly Tyr Asp Lys Lys Glu Pro Glu Lys Thr Val Ala Asp Asp Val 90 Ile Lys Thr Val Ile Pro Glu Asp Val Arg Pro Lys Phe Lys Pro Val 100 105 Gly Lys Ile Asp Leu Asp Lys Leu Asn Arg Lys Val Glu Lys Glu Pro 120 125 Met Lys Glu Glu Pro Lys Pro Gln Pro Val Ala Ala Glu Glu Lys Lys 135 Val Ala Glu Glu Val Lys Pro Val Val Ile Glu Val Lys Lys Glu Glu 150 155 Val Thr Val Thr Pro Ala Thr Ser Glu Pro Lys Pro Val Lys Glu Glu 165 170 Pro Lys Pro Val Val Val Glu Lys Pro Val Glu Thr Glu Lys Lys Val 185 Val Glu Glu Val Lys Lys Glu Glu Pro Lys Val Val Val Ser Pro Glu 200 Lys Thr Glu Lys Lys Glu Glu Lys Pro Val Ala Glu Ala Pro Val Thr 215 220 Pro Val Glu Lys Glu Glu Glu Gly Val Phe Lys Ile Arg Pro Thr Glu 230 235 Phe Val Ser Lys Ile Asn Val Ile Gly Gln Ile Asp Leu Ala Ala Leu 250 Asn Gln Ser Thr Arg Pro Lys Lys Lys Ser Lys Glu Glu Lys Arg Lys 260 265 Glu Arg Glu Glu Lys Glu Lys Leu Arg Gln Asp Gln Lys Lys Gln Met 280 Lys Glu Ala Ile Ile Lys Glu Ile Arg Lys Glu Asp Ser Lys Gln Ala 295 300 Lys Val Val Gly Lys Glu Asn Leu Asp Pro Asn Gly Lys Lys Lys Arg 315 Asn Arg Ile Asn Asn Asn Lys Glu Lys Val Asp Val Asn Asn Val Ala 325 330

Ser Asn Phe Ala His Pro Thr Pro Asn Ser Glu Arg Thr Asn Asn Asn

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Arg Gly Gly Asn Gln Gln Gly Gly Gly Gln Asn Arg Asn Arg Asn Asn Asn Asn Lys Asp Arg Phe Lys Lys Pro Val Val Lys Gln Glu Val Ser Glu Glu Asp Val Ala Lys Gln Val Lys Glu Thr Leu Ala Arg Leu Thr Ser Lys Gly Lys Asn Lys Gly Ala Lys Tyr Arg Lys Glu Lys Arg Asp Met Ala Ser Asn Arg Met Gln Glu Leu Glu Asp Gln Glu Met Ala Glu Ser Lys Val Leu Lys Leu Thr Glu Phe Val Thr Ala Asn Glu Leu Ala Ser Met Met Asn Val Ser Val Asn Gln Val Ile Gly Thr Cys Met Ser Ile Gly Met Met Val Ser Ile Asn Gln Arg Leu Asp Ala Glu Thr Ile Asn Leu Val Ala Glu Glu Phe Gly Phe Lys Thr Glu Tyr Val Ser Ala Glu Val Ala Gln Ala Ile Val Glu Glu Glu Asp Ala Pro Glu Asp Leu Glu His Arg Ala Pro Ile Val Thr Val Met Gly His Val Asp His Gly Lys Thr Ser Leu Leu Asp Tyr Ile Arg Lys Ala Asn Val Ile Ala Gly Glu Ala Gly Gly Ile Thr Gln His Ile Gly Ala Tyr His Val Thr Leu Glu Asp Gly Arg Lys Ile Thr Phe Leu Asp Thr Pro Gly His Glu Ala Phe Thr Ala Met Arg Ala Arg Gly Ala Lys Val Thr Asp Ile Ala Ile Ile Ile Val Ala Ala Asp Asp Val Met Pro Gln Thr Lys Glu Ala Ile Asn His Ala Ala Ala Gly Val Pro Ile Val Phe Ala Ile Asn Lys Ile Asp Lys Pro His Ala Asn Pro Glu Lys Ile Lys Glu Thr Leu Ala Gln Met Asn Tyr Leu Val Glu Glu Trp Gly Gly Lys Tyr Gln Ser Gln Asp Ile Ser Ala Lys Lys Gly Leu Gly Val Pro Glu Leu Met Glu Lys Val Leu Leu Glu Ala Glu Met Leu Asp Leu Lys Ala Asn Pro Asn Arg Asn Ala Thr Gly Ser Ile Ile Glu Ser Thr Leu Asp Lys Gly Arg Gly Tyr Val Ala Thr Val Leu Val Ser Asn Gly Thr Leu Lys Val Gly Asp Ile Val Leu Ala Gly Thr Ser Tyr Gly Arg Val Lys Ala Met Phe Asn Glu Arg Asn Gln Arg Val Ala Gln Ala Gly Pro Ser Glu Pro Val Leu Ile Leu Gly Leu Asn Gly Ala Pro Ala Ala Gly Asp Thr Phe His Val Ile Glu Thr Asp Gln Glu Ala Arg Glu Ile Ala Asn Lys Arg Glu Gln Leu Gln Arg Glu Gln Gly Leu Arg Thr Gln Lys Leu Leu Thr Leu Asp Glu Val Gly Arg Arg Ile Ala Leu Gly Asn Phe Gln Glu Leu 

Asn Val Ile Val Lys Gly Asp Val Asp Gly Ser Ile Glu Ala Leu Ser 825 Asp Ser Leu Ile Lys Leu Ser Thr Glu Gln Ile Gln Val Asn Val Ile 840 His Lys Ala Val Gly Gln Ile Ser Glu Ser Asp Val Thr Leu Ala Ala Ala Ser Asp Ala Ile Ile Ile Gly Phe Gln Val Arg Pro Ser Ala Ser 870 875 Ala Arg Lys Phe Ala Glu Gln Glu Gly Val Asp Ile Arg Leu Tyr Ser 885 890 Val Ile Tyr Ala Ala Ile Glu Glu Val Lys Ala Ala Met Glu Gly Met 905 Leu Ala Pro Glu Val Lys Glu Val Val Thr Ala Thr Ile Glu Val Arg 915 920 925 Glu Val Phe His Ile Thr Lys Val Gly Thr Val Ala Gly Ala Val Val 935 940 Lys Glu Gly Lys Val Lys Arg Ser Asp Lys Ala Arg Leu Ile Arg Asp 950 955 Gly Ile Val Ile Phe Ser Gly Ser Ile Asn Ala Leu Lys Arg Phe Lys 970 Asp Asp Val Lys Glu Val Gly Thr Asn Phe Glu Cys Gly Ile Ser Leu 980 985 Val Asn Tyr Asn Asp Leu Lys Val Gly Asp Met Ile Glu Thr Tyr Glu 1000 Glu Val Glu Val Lys Gln Thr Leu <210> 5289 <211> 416 <212> PRT <213> B.fragilis <400> 5289 Val Pro Gly Met Phe Tyr Leu Gln Ile Ile Ser Asp Lys Met Asn Ile His Lys Ile Arg Glu Asp Phe Pro Ile Leu Ser Arg Thr Val Tyr Gly 25 Lys Pro Leu Val Tyr Leu Asp Asn Gly Ala Thr Thr Gln Lys Pro Arg Leu Val Ile Asp Ser Ile Val Asp Glu Tyr Tyr Ser Val Asn Ala Asn 55 Val His Arg Gly Val His Phe Leu Ser Gln Gln Ala Thr Glu Leu His 70 75 Glu Ala Ser Arg Glu Thr Val Arg Gln Phe Ile Asn Ala Arg Ser Thr 85 90 Arg Glu Val Ile Phe Thr Arg Gly Thr Thr Glu Ser Ile Asn Leu Ile 100 105 Val Ser Ser Phe Gly Glu Glu Phe Met Gln Glu Gly Asp Glu Val Ile 120 Val Ser Val Met Glu His His Ser Asn Ile Val Pro Trp Gln Leu Leu 135 140 Ala Ala Arg Lys Gly Ile Ala Ile Lys Val Ile Pro Met Asn Asp Lys 150 155 Gly Glu Leu Leu Glu Glu Tyr Glu Asn Leu Phe Ser Glu Arg Thr 170 Lys Ile Val Ser Val Ala Gln Val Ser Asn Val Leu Gly Thr Ile Asn 185 Pro Val Lys Glu Met Ile Ala Thr Ala His Ala His Gly Val Pro Val

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Met Ile Asp Gly Ala Gln Ser Ile Pro His Met Lys Val Asp Val Gln 215 220 Asp Leu Asp Ala Asp Phe Phe Val Phe Ser Gly His Lys Ile Tyr Gly 230 235 Pro Thr Gly Ile Gly Val Leu Tyr Gly Lys Glu Asp Trp Leu Glu Arg 250 Leu Pro Pro Tyr Gln Gly Gly Glu Met Ile Gln Ser Val Ser Phe 265 Glu Lys Thr Val Phe Gly Glu Leu Pro Phe Lys Phe Glu Ala Gly Thr 280 285 Pro Asp Tyr Ile Ala Thr Thr Gly Leu Ala Lys Ala Leu Asp Tyr Val 295 Thr Gly Ile Gly Leu Asp Pro Ile Ala Leu His Glu His Glu Leu Thr 315 Val Tyr Ala Met Gln Arg Leu Lys Glu Ile Pro Asn Met Arg Ile Phe 325 330 Gly Glu Ala Glu His Lys Ser Ser Val Ile Ser Phe Leu Val Gly Asp 345 Ile His His Leu Asp Leu Gly Thr Leu Leu Asp Arg Leu Gly Ile Ala 360 Val Arg Thr Gly His His Cys Ala Glu Pro Leu Met Arg Arg Leu Gly 375 Ile Glu Gly Thr Val Arg Ala Ser Phe Ala Val Tyr Asn Thr Lys Glu 390 395 Glu Val Asp Ala Leu Val Ala Gly Ile Glu Arg Val Ser Lys Met Phe 405 410 <210> 5290 <211> 67 <212> PRT <213> B.fragilis <400> 5290 Ala Arg Phe Val Cys Thr Phe Ile Leu Arg Tyr Leu Asn Pro Gly Met 10 Leu Leu Lys Ile Leu Ala Ile Ala Gly Gly Ala Phe Thr Leu Gly Val Ile Phe Leu Gln Asp Ile Trp Gly Leu Tyr Cys Leu Val Ala Val Ser 40 Ala Cys Met Ser Leu Met Phe Pro Thr Ile Tyr Gly His Cys Ser Ser 55 Trp Phe Gly 65 <210> 5291 <211> 695 <212> PRT <213> B.fragilis <400> 5291 Tyr Gln Lys Ser Asn Cys Met Asn Glu Arg Ile Asn Tyr Leu Lys Thr Tyr Ile Leu Asp Lys Arg His His Ser Gln Arg Arg Thr Pro Ser Ser Ile Gly Leu Asp Lys Leu Asn Thr Ile Tyr Ala Gln Gln Gly Leu Ser 40 Pro Val Glu Arg Thr Thr Ala Cys Phe Ala Ala Leu Met Asn Ala Glu

Leu Pro Val Ile Leu Pro Gly Glu Lys Ile Val Phe Thr Arg Thr Leu

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Thr Gln Val Pro Asp Ile Tyr Thr Pro Glu Glu Trp Asn Glu Ile Lys Asn Lys Tyr Tyr Ile His Glu Lys Gly Thr Val Cys Asn Ile Ser Pro Asn Tyr Ala Tyr Thr Ile Gln His Gly Leu Glu Ala Arg Lys Gln Glu Ile Arg Lys Arg Gln Glu Asn Pro Ser Leu Asn Glu Arg Glu Arg Val Phe Leu Asn Ser Met Tyr Gln Cys Ile Ile Ser Leu Gln Lys Leu Ile Glu Lys Tyr Glu Gln Tyr Ala Leu Leu Asn Asn Glu Thr Glu Ile Ala His Thr Leu His Thr Ile Lys Thr Glu Gly Ala Gln Asn Phe Arg Gln Ala Leu Gln Leu Leu Arg Ile Leu His Phe Ser Ile Trp Glu Ala Gly Asn Tyr His Asn Thr Leu Gly Arg Phe Asp Gln Tyr Met Tyr Pro Phe Tyr Gln Arg Asp Leu Glu Asn Gly Thr Leu Thr Lys Glu Glu Ala Phe Asp Leu Leu Glu Glu Phe Phe Leu Val Cys Asn Lys Asp Ser Asp Leu Tyr Pro Gly Met Gln Gln Gly Asp Asn Gly Gln Ser Leu Val Leu Gly Gly Arg Asp Pro Glu Gly Lys Tyr Leu Phe Asn Asp Leu Ser Arg Met Cys Leu Gln Ala Ser Tyr Glu Leu Lys Leu Ile Asp Pro Lys Ile Asn Ile Arg Val Ala Pro Lys Thr Pro Asp Glu Ile Phe Thr Leu Gly Ser Arg Leu Thr Lys Ile Gly Leu Gly Phe Pro Gln Tyr Ser Asn Asp Asp Ile Ile Ile Pro Gly Leu Ile Arg Lys Gly Tyr Ser Lys Glu Asp Ala Tyr Asn Tyr Val Val Ala Ala Cys Trp Glu Phe Ile Ile Pro Asn Arg Ala Met Asp Ile Pro Asn Ile Asp Ala Val Ser Leu Ile Gly Cys Val Asp Arg Cys Leu Glu Lys Leu Asn Thr Cys Ser Asn Tyr Ser Ser Phe Tyr Thr Leu Val Glu Gln Glu Ile Gln Lys Glu Val Asn Ala Ile Cys Glu Lys His Arg Asn Leu Tyr Ile Ile Pro Ser Pro Met Met Ser Leu Leu Met Asp Gly Thr Ile Glu Arg Ala Lys Asp Ile Ser Glu Gly Ser Tyr Tyr Asn Asn Tyr Gly Ile His Gly Thr Gly Ile Ala Thr Ala Thr Asp Thr Leu Ala Ala Leu Lys Lys Tyr Tyr Phe Glu Glu Gln Ser Leu Asp Tyr Thr Thr Leu Leu Thr Ala Ile Arg Ser Asn Phe Lys Gly Tyr Glu Glu Leu Gln Lys Lys Leu Arg Glu Glu Ala Pro Lys Met Gly Gln Asp Asn Asp Tyr Ala Asp Leu Ile Ala Lys Asp Leu Leu Asp Ser Phe Asp Arg Ser Leu Ala Asp Lys Arg Asn Glu Arg Gly Gly Val Tyr Arg 

Ala Gly Thr Gly Thr Ala Met Tyr Tyr Ile Phe His Ser Asn Gln Leu 555 550 Arg Ala Thr Pro Asp Gly Arg Asn Asp Gly Glu Met Ile Pro Ala Asn 570 Tyr Ser Pro Ser Leu Phe Leu Lys Gln Lys Gly Pro Ile Ser Val Ile 585 Lys Ser Phe Thr Lys Gln His Leu Asp Arg Val Val Asn Gly Gly Pro 600 Leu Thr Leu Glu Phe Asp Gln Ser Val Phe Ser Asn Asp Glu Thr Ile 615 620 Glu Lys Leu Gly Met Leu Val Lys Thr Tyr Ile Val Leu Gly Gly His 630 635 Gln Leu Gln Leu Asn Thr Val Ser Arg Glu Thr Leu Leu His Ala Arg 645 650 Lys His Pro Glu Gln His Lys Asn Leu Ile Val Arg Val Trp Gly Trp 665 Ser Gly Tyr Phe Val Glu Leu Asp Glu Cys Tyr Gln Asn His Val Ile 680 675 Asn Arg Ile Glu Phe Gly Leu

<210> 5292 <211> 694 <212> PRT <213> B.fragilis

<400> 5292 Asn Gln Cys Thr Met Lys Thr Thr Lys His Leu Ser Val Ala Ala Val 10 Leu Thr Val Leu Met Gln Met Gly Cys Gln Ser His Thr Asp Asn Thr 25 Arg Gln Thr Leu His Leu Pro Glu Leu Asn Glu Val Arg Ile Glu Asp 40 Ala Phe Trp Ser Pro Lys Leu Asp Ile Trp Arg Lys Ile Thr Ala Asn 55 60 Asp Val Leu Asn Lys Phe Glu Gly Lys Tyr Thr Pro Phe Pro Gly Ser Thr Asp Thr Arg Asn Ala Phe Arg Asn Phe Asp Arg Val Ala Glu Gly 90 Gln Arg Asp Ile Lys Gln His Asp Gly Pro Glu Trp Tyr Asp Gly Leu 105 Val Tyr Glu Ser Ile Arg Gly Ile Ala Tyr Phe Leu Ala Ser His Pro 120 Asn Lys Glu Leu Glu Lys Arg Ile Asp Gly Tyr Val Asp Arg Ile Tyr 135 140 Ala Ala Gln Gln Thr Glu Pro Thr Gly Tyr Ile Asn Thr His Thr Gln 150 155 Leu Met Glu Asn Asn His Arg Trp Gly Asp Asn Gly Gly Leu Leu Arg 165 170 Gly Gln His Asp Val Tyr Asn Ala Gly Met Leu Ile Glu Ala Gly Val 180 185 His Tyr Tyr Gln Ala Thr Gly Lys Thr Arg Leu Leu Glu Ile Ala Thr 200 Arg Phe Ala Asn Tyr Met Ala Asp Tyr Met Gly Pro Glu Pro Arg Lys 215 220 Asn Ile Val Pro Ala His Ser Gly Pro Glu Glu Ala Val Met Ala Leu 230 235 Tyr Trp Leu Tyr Lys Asn Glu Pro Glu Leu Lys Asp Lys Leu Ser Ile 245 250

Pro Val Arg Glu Ser Asp Tyr Tyr Asn Leu Ala Thr Phe Trp Ile Glu 265 260 270 Asn Arg Gly His His Cys Gly Phe Pro Leu Trp Gly Thr Trp Gly Tyr 280 Arg Lys Ser Glu Lys Trp Ile Lys Asp Ala Cys Tyr His Gln Ala Glu 295 300 Phe Gly Thr His Ser Arg Pro Ser Trp Gly Glu Tyr Ser Gln Asp Ser 310 Ile Pro Val Leu Glu Gln Lys Thr Ile Glu Gly His Ala Val Arg Ala 330 325 Thr Leu Met Ala Thr Gly Leu Thr Ala Ala Ala Leu Glu Asn Gln Ser 345 Pro Gln Tyr Ile Glu Thr Ala Lys Arg Leu Trp Glu Asn Met Ala Gly 355 360 365 Lys Arg Met Phe Ile Thr Gly Gly Val Gly Ala Ile His Glu Asp Glu 375 Lys Phe Gly Pro Asp Tyr Phe Leu Pro Thr Asp Ala Tyr Leu Glu Thr 390 395 Cys Ala Ala Val Gly Ala Gly Phe Phe Ser Gln Arg Met Asn Gln Leu 405 410 Thr Cys Asn Ala Arg Tyr Met Asp Glu Val Glu Arg Val Leu Tyr Asn 425 Asn Val Leu Thr Gly Val Ser Leu Ser Gly Asp Lys Tyr Thr Tyr Gln 440 Asn Pro Leu Asn Thr Asp Lys Pro Asp Arg Trp Glu Trp His Val Cys 455 Pro Cys Cys Pro Pro Met Phe Leu Lys Ile Met Ala Ala Met Pro Gly 475 Tyr Ile Tyr Ala Tyr Gln Gly Asp Asn Val Tyr Val Asn Leu Phe Ile 485 490 Gly Ser Glu Val Arg Ile Pro Val Gly Asp Asn Ser Val Arg Leu Lys 505 Gln Leu Thr Ser Tyr Pro Trp His Gly Ala Val Ser Ile Gln Val Asn 520 525 Pro Asp Lys Ala Ser Thr Phe Ser Met Lys Val Arg Ile Pro Gly Trp 535 540 Ala Gln Gly Thr Glu Asn Pro Tyr Asp Leu Tyr Gln Ser Asn Leu Lys 550 555 Ala Pro Val Lys Leu Lys Val Asn Gln Glu Asp Val Leu Leu Arg Ile 570 Val Asp Gly Tyr Ala Glu Ile Asn Arg Glu Trp Lys Lys Gly Asp His 585 Ile Glu Leu Glu Leu Pro Met Gln Pro Arg Leu Ile Thr Ala Asn Lys 600 Ala Val Glu Asn Leu Arg Gly Gln Val Ala Leu Ala Ser Gly Pro Ile 615 620 Ile Tyr Cys Phe Glu Asp Ala Asp Asn Pro Glu Leu Gln Thr Phe Lys 630 635 Leu Gln Ala Gln Thr Pro Leu Glu Leu Ser His Asp Ser Asn Leu Leu 645 650 Asn Gly Val Asn Ile Ile Lys Cys Gln Gly Asp Ile Pro Ala Lys Ala 665 Ile Pro Tyr Tyr Ala Val Ala Asn Arg Glu Glu Ser His Ser Tyr Lys 680 Val Trp Ile Pro Gln Lys 690

<210> 5293 <211> 260 <212> PRT <213> B.fragilis

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<210> 5294 <211> 263

<213> B.fragilis

<400> 5294

<212> PRT

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<400> 5295

<210> 5296 <211> 235 <212> PRT <213> B.fragilis

<400> 5296

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Leu Phe Pro Arg Cys Cys Val Val Cys Gly Ala Pro Leu Ser Lys Glu Glu Glu Cys Leu Cys Ile Arg Cys Asn Met Asn Leu Pro Arg Thr Gly 35
Phe His Leu Arg Lys Asp Asn Pro Val Glu Cys Leu Phe Trp Gly Arg 50
Ser Asp Phe Arg Arg Ile Leu His Leu His Leu Leu Lys Tyr Ser Gly Tyr Lys 85
Glu Leu Gly Glu Val Met Gly Arg Tyr Met Ala Ala Glu Leu Ile Ser 10
Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His Ser Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His Cys Gly Phe Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His Cys Gly Phe Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His Cys Gly Phe Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His Cys Cys Gly Phe Phe Asp His Val Asp Val Ile Val Pro Val Pro Leu His

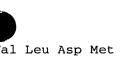
2140 125 120 Lys Lys Lys Gln Lys Leu Arg Gly Tyr Asn Gln Ser Glu Trp Ile Ala 140 135 Arg Gly Ile Ser Ser Val Thr Gly Ile Pro Leu Asn Ala Lys Ser Val 155 150 Ile Arg Glu Lys Asn Thr Glu Thr Gln Thr Arg Lys Ser Thr Phe Glu 170 165 Arg Ser Glu Asn Val Asp Gly Ile Phe Lys Leu Cys Asp Val Ala Cys 185 Phe Gln Gly Lys His Val Leu Ile Ile Asp Asp Val Leu Thr Thr Gly 200 195 Ser Thr Thr Val Ala Cys Ala Ser Thr Leu Phe Glu Val Glu Gly Val 215 220 Arg Ile Ser Val Leu Thr Leu Ala Val Ala Glu 230 <210> 5297 <211> 88 <212> PRT <213> B.fragilis <400> 5297 Ile Leu Phe Lys Arg Met Lys Ile Thr Ser Tyr Val Ser Phe Leu Tyr 10 Cys Leu Cys Leu Met Leu Ala Ser Pro Thr Val Gln Ala Ser Glu Val Arg Thr Ala Ile Phe Glu Gly Lys Pro Cys Ile Asn Pro Pro His Val 40 Val Gly Asn Tyr Pro Ala Thr Pro Phe Leu Phe Tyr Ile Pro Thr Ser 55 Gly Glu Arg Pro Ile Lys Trp His Ala Glu Asn Leu Pro Lys Gly Leu 75 70 Lys Leu Asp Lys Arg Asn Gly Gly

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<213> B.fragilis

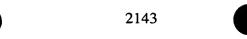
<400> 5298

Ile Ser Val Cys Asp His Lys Tyr Leu Phe Asp Ser Phe Leu Phe Gln Thr Phe Val Leu Tyr Val Ile Lys Arg Arg Met Lys Lys Ser Thr Phe 25 Thr Leu Ile Leu Phe Phe Ser Ser Val Ile Leu Tyr Ala Gln Gln Asn 40 Glu Leu Met Phe His Ser Leu Gly Ser Gln His Gly Leu Thr Tyr Ser 60 55 Ala Val Arg Asp Ile Leu Gln Asp Ser Lys Gly Tyr Ile Trp Ile Ala 75 Thr Leu Lys Gly Leu Asn Arg Tyr Asp Gly Tyr Asn Ile Lys Gln Tyr 90 Tyr Lys Ser Asp Asp Gly Leu Ser Ser Asn Cys Ile Glu Lys Leu Leu 105 Leu Leu Gly Gln Asp Thr Leu Leu Met Gly Thr Asn Glu Gly Leu Cys 125 120 Leu Tyr Asp Met Met Arg Glu Lys Phe Thr Thr Ile Val Pro Gln Thr 140 130



Lys Ala Pro Leu Tyr Val Leu Asp Met Ala Tyr Asp Gly Arg Ser Val Phe Ile Ala Ser Asp Ser Gly Leu Tyr Val Tyr Asn Lys Thr Glu Gln Ser Met Pro Leu Leu His Lys Gly Leu Ile Val Lys Val Thr Leu Asp Ile Asn Gly Asn Val Trp Ala Val Ser Pro Asn Thr Ile Tyr Cys Phe Arg Pro Asn Gly Gln Met Thr Arg Lys Ile Thr Ala Thr Glu Val Ser Pro Asp Tyr Pro Val Glu Phe Thr Ser Ile Tyr Lys Asp Ser Gln Gly Thr Leu Trp Leu Gly Thr Thr Glu Asn Gly Leu Tyr Arg Tyr Asn Lys Asn Tyr Asn Gln Phe Val Ser Val Glu Phe Ala Ser Gln Asp Arg Lys Asp Met Arg Tyr Ile Arg Cys Ile Gln Glu Asp Met Arg Gly Asn Leu Trp Ile Gly Thr Glu Asn Gly Leu Phe Ile Tyr Asp Tyr Thr Asp Asn Ser Tyr Ile Gln Tyr Arg Gln His Ala Lys Asp Val Gln Ser Gly Leu Thr Asp Asn Ala Ile Tyr Thr Ile Tyr Lys Ser Arg Gly Asp Ile Met Trp Ile Gly Thr Phe Phe Gly Gly Val Ser Tyr Thr Ser Leu Thr Glu Asn Asn Phe His Tyr Leu Ile Ala Asp Asn Gly Lys Gln Tyr Leu Lys Gly Lys Ala Ile Ser Asn Ile Ile Lys Asp Lys Asn Gly Ala Leu Trp Phe Ala Ser Glu Asp His Gly Ile Ser Ile Leu Tyr Pro Asp Gly His Ile Arg Tyr Leu Asn Lys Ser Thr His Pro Ser Leu Asn Gly Asp Asn Val His Ala Leu Ala Glu Asp His Ser Gly Asn Ile Trp Ile Gly Asn Phe Ile Asp Gly Leu Gln Lys Val Asp Leu Ala Lys Gly Tyr Ile Arg Ser Tyr Lys Asn Ile Ala Gly Gly His Ala Gly Leu Ser Asn Asn Ser Ile Tyr Lys Leu Tyr Val His Asn Pro Asp Thr Met Phe Ile Gly Thr Ser Gln Gly Val Asn Ile Tyr His Phe Arg Thr Asp Ser Phe Thr Pro Phe Leu Pro Asp Val Phe Arg Leu Ile Arg Ile Asp Asp Ile Thr Arg Asp Leu Lys Gly Asn Ile Trp Phe Ser Thr His Phe Asn Gly Ile Phe Arg Tyr His Ile Pro Thr His Ser Ile His Arg Tyr Gln Lys Gly Val Thr Gly Cys Lys Thr Met Thr Ser Asp Asn Ile Tyr Cys Ser Phe Val Asp Ser Lys Gly Glu Val Trp Phe Gly Thr Ser Asn Gly Gly Leu Met Lys Tyr Asn Ala Arg Ala Asp Ser Ile Gln Ala Phe Gly Lys Glu Asn Glu Leu Arg Gln Arg Asp Ile Tyr Ser Ile Gln Glu Asp Ser Phe Gly Tyr Leu Trp Met Ser Thr Asp Asn Gly Ile Phe Ser Phe Asn Pro Glu

615 620 Ser Arg Ser Phe Ala His Tyr Lys Val Ser Asp Asn Leu Val Ser Asn 630 635 Gln Phe Asn Ala Cys Pro Gly Tyr Lys Asp Pro Asp Gly Thr Leu Phe 645 650 Phe Gly Ser Ile Asn Gly Val Cys Phe Phe Arg Pro Glu Gly Leu Asn 665 His Asn Ser Pro Thr Asn Asp Ile His Leu Thr Phe Ser Asp Phe Arg 680 685 Ile Phe Asn Lys His Val Gln Pro Ser Pro Asp Gly Ile Leu Gln Asn 695 700 Asn Ile Asp Ser Thr Ser Ala Ile Arg Leu Pro His Gly Met Asn Thr 710 715 Leu Thr Phe Asp Phe Leu Val Ile Asn Tyr Asn Glu Asn Cys Gln Ser 725 730 Gln Leu Ser Cys Glu Tyr Tyr Leu Glu Gly Met Glu Thr Glu Trp Asn 740 745 Ala Thr Gln Gln Ile Pro Gln Ser Val Thr Tyr Thr Asn Leu Asp Pro 760 765 Gly Thr Tyr Gln Phe His Val Arg Val Ile Gly Lys Asn Gly Val Val 775 Phe Asp Arg Arg Lys Ile Thr Ile Asn Ile Arg Pro His Phe Leu Leu 790 795 Ser Gly Phe Met Ile Thr Ile Tyr Ser Leu Ile Gly Leu Leu Ile Ser 805 810 Phe Ile Ile Val Arg Phe Tyr Gln Val Arg Met Arg Asp Lys Met Asp 825 Ile Arg Ile Glu Arg Met Glu Lys Asn Asn Leu Arg Glu Leu Asn Lys 840 His Lys Leu Asn Phe Phe Thr Tyr Ile Thr His Glu Phe Lys Thr Pro 855 860 Leu Ser Ile Leu Met Ala Val Phe Glu Asp Ile Ser Ile Gly Arg Asn 870 875 Asn Thr Ile Thr Gly Glu Glu Met Lys Ile Ile Asn Arg Asn Ile Gln 885 890 Arg Leu Gln Phe Leu Ile Asn Gln Leu Leu Glu Phe Arg Ser Val Glu 905 Thr Asp His Ala Arg Ile Glu Tyr Val Lys Gly Asp Ile Met Thr Tyr 920 Gly Arg Ser Ile Phe Glu Leu Phe Ile Pro Val Phe Arg Gln Lys Gln 935 Ile Val Phe Gln Tyr Ala Thr Ser Ala Asp Ser Tyr Tyr Thr Val Phe 950 955 Asp Arg Asp Lys Ile Glu Lys Ile Ile Ser Asn Leu Leu Ser Asn Ala 970 Phe Lys His Ser Asp Pro Gln Ser Glu Ile Asn Phe Arg Ile Asp Val 985 Asp Lys Ala Ser Gly Gln Leu Ile Leu Ser Cys His Asn Ser Ser Ser 1000 Tyr Ile His Pro Glu Gln Arg Glu Ala Val Met Gln Pro Phe His Lys 1015 1020 Thr Asp Ser Ser Asp Gln Lys Tyr Ser Asn Thr Gly Ile Gly Leu Ala 1030 1035 Leu Val Asn Gly Leu Val Gln Leu Leu Ser Gly Thr Val Glu Ile Glu 1045 1050 Ser His Gln Asn Ser Gly Thr Thr Phe Lys Val Lys Leu Pro Leu Val 1060 1065 Glu Asp Ser Lys Asp Met Ile Ala Pro Asp Glu Thr Leu Asp Ile Val 1075 1080



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Asn Ser Pro Asp Val Val Ala Asp Thr Val Tyr Leu Leu Asn Asn Ser
                          1100
  1090 1095
Gly Leu Lys Glu Asp Met Asn Ala Ala Asn Ala Glu Lys Lys Met Thr
      1110 1115
Val Leu Leu Val Glu Asp Asn Pro Asp Ile Asn Asn Ile Leu Lys Ser
            1125 1130
Lys Leu Leu Arg Leu Tyr Lys Val Lys Thr Ala Tyr Asn Gly Gln Glu
                          1145
Ala Val Glu Leu Leu Lys Thr His Ile Ile Asp Ile Ile Ile Ser Asp
            1160
                                      1165
Ile Met Met Pro Tyr Met Asp Gly Tyr Glu Leu Ser Lys Tyr Ile Lys
         1175
Thr Ser Arg Glu Tyr Ser His Ile Pro Val Ile Leu Ile Thr Ser Gln
                      1195
     1190
Pro Ser Lys Glu Asn Glu Leu Gln Gly Leu Ser Ala Gly Ala Asp Ala
            1205
                   1210 1215
Tyr Ile Glu Lys Pro Phe Thr Phe Asp Glu Leu Asn Leu Arg Ile Thr
         1220 1225
                              1230
Asn Leu Leu Lys Ala Lys Asn Asn Ile Arg Glu His Tyr His Asp Met
            1240
                                      1245
Lys Ile Phe Gln Leu Asn Glu Glu Leu Asn Asn Lys Asp Glu Glu Phe
                  1255
                                   1260
Ile Lys Ser Leu Thr Gln Phe Val Ile Glu His Ile Glu Asp Pro Glu
                1270
                                1275
Leu Ser Val Asp Gln Leu Thr Thr His Met Asn Ile Ser Arg Thr Gln
            1285 1290 1295
Leu Tyr Asn Lys Leu Lys Lys Leu Leu Asn Leu Ser Ala Thr Glu Phe
 1300 1305 1310
Ile Asn Lys Ile Lys Ile Asp Val Ala Lys Val Lys Ile Ile Lys Thr
 1315 1320
                                      1325
Asn Leu Thr Ile Ala Glu Ile Ser Trp Gln Leu Gly Phe Asn Asn Pro
1330 1335 1340
Ser Tyr Phe Ser Lys Thr Phe Lys Arg Phe Cys Gly Val Thr Pro Asn
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Glu Phe Lys Asn Gly Lys Ser Gln
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Lys His Pro Arg Ile Tyr Leu Lys Ser Phe Asn Tyr Gln Ile Gly Cys
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Gln His Phe Leu Asp Cys Leu Ser Lys Ser Leu Glu Met Gly Gly Cys
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Arg Met Tyr Ile His Gly Thr Leu Val Phe Val Leu Phe Val Glu Asn
                   55
Glu Ser Tyr Gly Leu
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<212> PRT
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<213> B.fragilis

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<212> PRT

<213> B.fragilis

<400> 5301

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25 Leu Leu Ile Asn Ile Gly Asp Glu Leu Leu Leu Thr Pro Pro Met Gly 40 45 Trp Asn Ser Trp Asn Thr Phe Gly Arg His Leu Thr Glu Glu Leu Leu 55 Leu Gln Thr Ala Asp Ala Met Val Glu Asn Gly Met Arg Asp Leu Gly 70 75 Tyr Ala Tyr Ile Asn Ile Asp Asp Phe Trp Gln Leu Pro Glu Arg Gly 85 90 Ala Asp Gly His Ile Gln Ile Asp Lys Thr Lys Phe Pro Arg Gly Ile 105 Lys Tyr Val Ala Asp Tyr Leu His Glu Arg Gly Phe Lys Leu Gly Ile 120 Tyr Ser Asp Ala Ala Asp Lys Thr Cys Gly Gly Val Cys Gly Ser Tyr 135 140 Gly Tyr Glu Glu Ile Asp Ala Arg Asp Phe Ala Ser Trp Gly Val Asp 150 155 Leu Leu Lys Tyr Asp Tyr Cys Asn Ala Pro Ala Gly Arg Val Glu Ala 165 170 Met Glu Arg Tyr Glu Lys Met Gly Arg Ala Leu Arg Ala Thr Asp Arg 180 185 Ser Ile Val Phe Ser Ile Cys Glu Trp Gly Gln Arg Glu Pro Trp Lys 200 Trp Ala Lys Lys Val Gly Gly His Leu Trp Arg Val Ser Gly Asp Ile 215 220 Gly Asp Leu Trp Asn Arg Ser Thr Asp Glu Lys Gly Gly Leu Arg Gly 230 235 Ile Leu Asn Ile Leu Glu Ile Asn Ala Pro Leu Ser Glu Tyr Ala Arg 245 250 Pro Gly Gly Trp Asn Asp Pro Asp Met Leu Val Val Gly Ile Gly Gly 260 265 Lys Ser Lys Ser Ile Gly Tyr Glu Ser Glu Gly Cys Thr Asn Glu Gln 275 280 Tyr Gln Ser His Phe Ala Leu Trp Cys Met Met Ala Ser Pro Leu Leu 295 Cys Gly Asn Asp Val Arg Gln Met Asn Asp Ser Thr Leu Gln Ile Leu 310 315 Leu Asn Lys Asp Leu Ile Ala Ile Asp Gln Asp Pro Leu Gly Ile Gln 325 Ala Glu Arg Ala Ile Arg Ala Asp His Tyr Asp Val Trp Val Lys Pro 345 Leu Ser Asp Gly Ser Lys Ala Ile Ala Cys Leu Asn Arg Ile Ser Gly 360 Pro Val Asp Val Glu Leu Asn Val Lys Thr Val Glu Gly Leu Ser Leu 375 380 Asp Arg Val Tyr Asp Val Ile Glu Gly Ser Leu Val Ala Glu Ala Ser 390 395 Thr Gly Trp Val Val Lys Leu Ala Pro Gly Glu Cys Lys Val Phe Ile 410

<210> 5302

<211> 96

Cys Lys

<212> PRT

<213> B.fragilis

<400> 5302

Ile Ile Ile Met Glu Lys Lys Thr Ile Val Ala Arg Val Glu Val Leu

<210> 5303

<211> 1060

<212> PRT

<213> B.fragilis

<220>

<221> UNSURE

<222> (916)

<223> Identity of amino acid sequences at the above locations are unknown.

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Thr Glu Gly Arg Ile Lys Ala Val Phe Leu Ile Cys Met Phe Val Leu 20 25 30

Val Ser Ala Gly Gly Phe Ala Gln Asn Thr Lys Ser Ile Ser Gly Thr 35 40 45

Val Arg Glu Lys Gly Ser Asn Glu Thr Val Ile Gly Ala Thr Val Gln 50 55 60

Val Lys Gly Thr His Asn Gly Val Ile Thr Asn Glu Asn Gly Glu Tyr 65 70 75 80

Thr Ile Lys Asn Val Ser Pro Gly Gln Val Leu Val Phe Ser Met Ile

85 90 95
Gly Met Asn Thr Val Glu Lys Thr Val Gly Ser Gln Asn Arg Ile Asp

Val Leu Met Asp Ala Gly Val Leu Ile Asp Glu Val Val Val Thr Gly
115 120 125

Tyr Gln Thr Gln Arg Lys Val Asp Leu Thr Gly Ser Val Ser Ser Leu 130 135 140

Ser Ser Asp Gln Phe Met Gln Thr Asn Pro Leu Ser Leu Glu Gln Ala
145 150 155 160

Leu Lys Gly Lys Ile Ser Gly Val Gln Val Met Asn Asn Asp Gly Ala
165 170 175

Pro Gly Gly Gly Ile Thr Ile Lys Ile Arg Gly Ala Ser Ser Ile Thr 180 185 190

Ala Gly Ser Ser Pro Leu Tyr Val Ile Asp Gly Phe Pro Leu Pro Ile 195 200 205

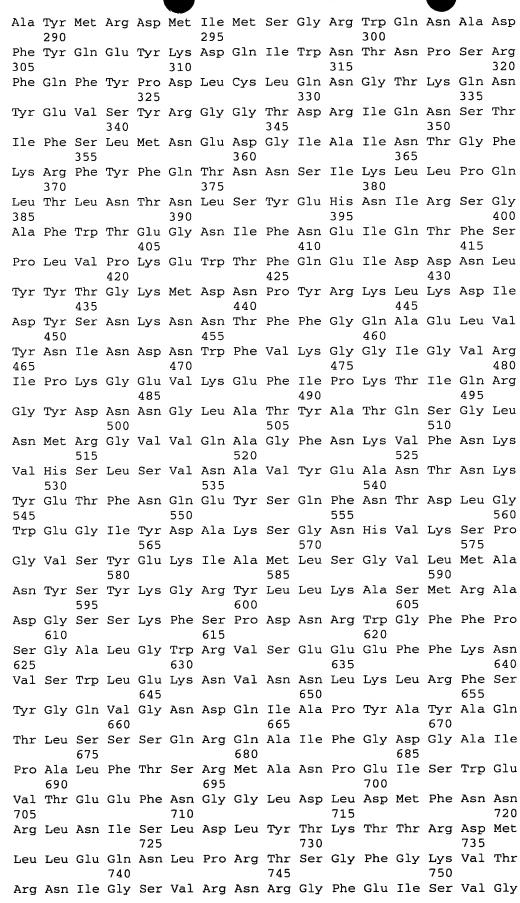
Ser Asp Asp Pro Leu Glu Ser Pro Leu Ala Thr Ile Ser Pro Asp Ala 210 215 220

Ile Glu Ser Ile Ser Ile Leu Lys Asp Val Ser Ser Thr Ala Ile Tyr 225 230 235 240

Gly Ala Gln Gly Ala Asn Gly Val Val Leu Ile Thr Thr Lys Lys Gly
245 250 255

Ser Ala Gly Met Ser Glu Ile Ser Val Lys Ala Thr Tyr Gly Ile Ser 260 265 270

Lys Leu Ala Asn Ser Ile Pro Met Leu Gly Ala Glu Asp Tyr Met Arg
275
280
285



765 760 Gly Val Leu Ile Asp Lys Lys Asp Phe Thr Trp Asn Ala Thr Val Asn 775 Phe Ser Ser Asn Gln Ser Lys Val Leu Ser Leu Gly Ala Glu Thr Gln 795 790 Met Leu Glu Gly Arg Pro Val Gly Ser Ala Ser Gly Ser Glu Asn Val 810 805 Leu Ile Lys Lys Gly Tyr Pro Leu Gly Leu Phe Tyr Gly Leu Gln Met 825 Glu Gly Ile Arg Ser Asn Trp His Ser Asp Tyr Asn Gly Ile Gly Ser 840 Ala Asp Ser Pro Trp Trp Tyr Ala Thr Glu Arg Glu Met Pro Tyr Gly 855 860 Phe Pro Ser Phe Ala Asp Thr Asn Gly Asp Gly Lys Val Asp Met Ser 875 870 Asp Arg Val Val Ile Gly Asp Val Asn Pro Val Phe Ile Gly Gly Leu 885 890 Asn Thr Arg Leu Arg Trp Lys Phe Ile Glu Leu Ala Met Glu Phe Ser 905 900 Trp Ser Tyr Xaa Asn Asp Ile Ser Asn Gly Asn Val Tyr His Leu Met 920 Thr Asn Gly Asp Ile Arg Asn Lys Ser Ala Val Tyr Tyr Lys Asp Ala 935 940 Trp Phe Ala Asn Asn Pro Thr Gly Thr Leu Gln Gly Pro Gly Ala Ile 950 955 Asp Trp Ser Gly Tyr Met Trp Ala Ala Ser Asn Ser Glu Met Val Glu 970 965 Asp Gly Ser Phe Leu Lys Met Asn Asn Leu Ala Val Thr Phe Arg Met 985 Pro Lys Asn Ile Leu Lys Ala Trp Lys Ile Lys Asp Leu Ala Leu Thr 1000 1005 Tyr Thr Ile Asn Asn Val Phe Cys Leu Thr Asn Tyr Ser Gly Tyr Asp 1015 1020 Pro Glu Val Arg Ser Gly Ser Ser Val Asn Asn Arg Ile Leu Pro Gly 1030 1035 Val Asp Ile Ser Ala Tyr Pro Tyr Ala Arg Ser His Ile Phe Ser Leu 1050 1045 Asn Phe Lys Tyr 1060

<210> 5304 <211> 382

<212> PRT

<213> B.fragilis

<400> 5304

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<210> 5305 <211> 271

<212> PRT

<213> B.fragilis

<400> 5305

Glu Cys Phe Tyr Ala Trp Lys Gly Gly Lys Ala Trp Met Asn Gly Asp

115

130 135 140 Glu Leu His Val Ser Lys Ile Glu Asn Ile Glu Glu Ala Phe Val Ile 150 155 Thr Glu Leu Pro Tyr Asn His Arg Gln Tyr Lys Arg Thr Ala Glu Tyr 165 170 Leu Leu Lys Gln Leu Tyr Gly Val Val Gly Gly Ile Arg Met Asn Gly Ser Ala Ala Ser Ala Leu Cys Tyr Val Ala Ala Gly Arg Phe Asp Ala 200 Trp Ala Glu Ala Phe Ile Gly Lys Trp Asp Tyr Ser Ala Ala Ala Leu 215 Ile Val Leu Glu Ala Gly Gly Lys Val Thr Asp Phe Phe Gly Ser Glu 230 235 Tyr Phe Ile Glu Gly His His Ile Ile Ala Thr Asn Gly Pro Leu His 250 Pro Val Phe Gln Arg Leu Leu Lys Glu Met Pro Pro Leu Glu Met 265 <210> 5306 <211> 95 <212> PRT <213> B.fragilis <400> 5306 Gly Thr Ala Met Lys Lys Ile Leu Leu Ala Leu Leu Thr Ser Cys Ala 5 10 Leu Val Ser Cys Glu Gly Tyr Phe Asp Gln Leu Pro Lys Thr Glu Leu 25 Pro Ser Glu Thr Phe Tyr Thr Ser Tyr Asp Ala Ala Leu Arg Asn Val 40 Ala Ile Leu Tyr Ala Asn Ala Gly His Val Asn Asp Gly Ile Met Thr 55 Thr Asp Arg Phe Met Met Pro Ser Leu Met Asn Glu Gly Pro Phe Asp 70 75 Leu Thr Ser Thr Ser Val Phe Thr Thr Gly Leu Gln Gly Cys Thr <210> 5307 <211> 443 <212> PRT <213> B.fragilis <400> 5307 Tyr Ile Cys Ile Met Lys Asn Thr Ala Lys Asn Phe Met Phe Tyr Val 10 Ala Phe Val Ala Ser Leu Gly Gly Leu Leu Phe Gly Phe Asp Thr Ala 25 Val Ile Ser Gly Ala Glu Lys Ser Ile Gln Val Val Tyr Asp Leu Ser 40 Asp Phe Ser His Gly Phe Thr Ile Ala Ile Ala Leu Ile Gly Thr Ile 55 Ile Gly Ala Phe Val Cys Ser Lys Pro Val Glu Lys His Gly Arg Leu 75 Lys Ala Leu Lys Ile Ile Ala Phe Leu Tyr Phe Val Ser Ala Val Gly 90 Ser Ala Ala Ile Ile Asp Trp Tyr Ser Phe Leu Phe Phe Arg Phe Ala 105 110 Gly Gly Leu Ala Val Gly Ala Ser Ser Val Val Gly Pro Met Tyr Ile

120

Ala Glu Ile Ser Pro Ser Arg Trp Arg Gly Arg Phe Val Ala Phe Phe 130 135 140 Gln Phe Asn Ile Val Leu Gly Ile Val Leu Ala Tyr Phe Ser Asn Tyr 155 Trp Ile His Gly Ile Ala His Asp Trp Gln Trp Met Leu Gly Val Glu 165 170 Ala Ile Pro Ala Ile Ala Phe Ala Leu Leu Leu Tyr Thr Val Pro Glu 185 Ser Pro Arg Trp Leu Val Lys Gln Asp Arg Glu Ala Glu Ala Arg His 200 Val Ile Lys Lys Val Ser Asn Ala Asn Ile Glu Gln Glu Ile His Glu 215 220 Ile Lys Glu Ser Leu Val Thr Ile Gly Ala Ser Gly Glu Lys Leu Phe 230 235 Gln His Lys Tyr Arg Lys Pro Ile Leu Tyr Ala Phe Leu Ile Ala Thr 245 250 Phe Asn Gln Leu Ser Gly Ile Asn Ala Ile Leu Tyr Tyr Ala Pro Arg 260 265 Ile Phe Glu Met Ser Gly Val Phe Thr Asp Ser Ala Met Met Gln Ser 280 285 Ile Val Ile Gly Leu Thr Asn Leu Thr Phe Thr Met Ile Gly Met Ile 295 Leu Ile Asp Gln Val Gly Arg Lys Leu Leu Tyr Ile Gly Ser Ile 315 Gly Met Thr Phe Ser Leu Ala Leu Val Ala Lys Gly Phe Tyr Gln Gly 325 330 Ala Phe Ser Gly Tyr Tyr Met Leu Ile Cys Leu Met Gly Phe Ile Ala 345 Phe Phe Ala Ile Ser Leu Gly Ala Val Ile Trp Val Leu Ile Ser Glu 360 Val Phe Pro Asn Asn Val Arg Ser Lys Gly Gln Val Leu Gly Ser Met 375 380 Thr His Trp Val Trp Ser Ala Leu Leu Ser Trp Met Phe Pro Val Phe 390 395 Ile Arg Thr Gly Gly Thr Phe Ile Phe Ser Phe Phe Ala Ile Met Met 405 410 Phe Leu Ser Phe Phe Phe Ala Leu Arg Leu Pro Glu Thr Lys Asn Lys 425 Ser Leu Glu Gln Ile Gln Lys Glu Leu Thr Asn 435

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<213> B.fragilis

<400> 5308

<210> 5309

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Asn Gln Ser Ile Phe Phe Ile Glu Asp Trp His Tyr Leu Leu Val Leu
Phe Tyr Trp Lys Ser Glu Gly Ile Ser Ile Pro Phe Asn Pro Ile
                             40
Ala Ile Pro Asn Pro Ala Thr Pro Tyr Ser Asp Lys Gln Arg Met Lys
Asp Asn Arg Ser
65
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<211> 79
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<213> B.fragilis
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1
Lys Gln Asp Ala Ile Val Pro Leu Pro Met Ile Leu Pro Asp Phe Asp
Ser Gln Glu Arg Cys Tyr Tyr Tyr Ser Ala Gln Pro Val Ile Ser Asp
                            40
Val Cys Glu Ile Ser Arg Asp Tyr Phe Asn Lys Asp Phe Ser Lys Asn
Tyr Lys Leu Glu Phe Lys Leu Lys Ile Val Asn Tyr Phe Phe Asn
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<211> 162
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<213> B.fragilis
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Ser His Glu Leu Leu His Leu Gly Leu Asp Gly Glu Pro Ile Tyr Ser
                                2.5
Asp Arg Phe Arg Gln Leu Asn Thr Asp Val Tyr His Arg Cys Glu His
                            40
Leu Phe Gly Ser His Gly Arg Thr Leu Glu Glu Glu Ala Ser Leu Cys
                                             60
Ile Ala Leu Leu Thr Gly Tyr Asn Ala Thr Ile Tyr Asn His Gly Asp
                    70
                                        75
Lys Glu Asp Lys Ile Gln Ser Val Leu Asn Arg Ser Trp Asp Leu Leu
                                    90
Asp Thr Leu Pro Val Ser Leu Leu Lys Cys Arg Leu Leu Val Ala Cys
            100
                                105
Tyr Ala Glu Val Phe Asp Glu Glu Leu Ala Ala Glu Ala His Ala Ile
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120 Ile Asp Gly Trp Lys Asp Arg Glu Leu Thr Arg Glu Glu Phe Glu Ile

Val Glu His Leu Lys Ser Leu Glu Glu Asn Pro Tyr Pro Asn Thr Asp

140

160

155

135

Ile Glu

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Met Ala Ala Thr Lys Ile Phe Asn Leu Trp Ala Lys Arg Ser Pro Glu
                                 25
Trp Glu Thr Lys Tyr Glu Asp Thr Leu Leu Lys Ala Phe Cys Asp Tyr
                            40
Gly Lys Gly Ser Thr Ser Tyr Gln Glu Thr Arg Ala Lys Leu Phe Gly
                         55
Ala Gly Tyr Glu Leu Tyr Ile Leu Ala Phe Phe Ile Gly Leu Tyr His
                    70
Gly Gln Thr Lys Asp Leu Val Ala Asp Lys Ala Lys Arg Lys Asp Phe
                85
                                     90
Gly Trp Ala Ile Glu Asn Trp Gly Thr Ala Glu Ala Arg Gly Gly Arg
                                105
Lys Gln Tyr Gly Gln Ile Arg Glu Tyr Met Phe Met Ala Leu Val Ala
        115
                            120
Arg Thr Gly Ile Asp Trp Ile Ala Leu Asp Lys Gly Asp Ile Thr Pro
                        135
Arg Lys Val Val Asp Leu Leu Ile Asp Lys Met Glu Lys Tyr Ala Asn
                    150
                                        155
Phe Gly Phe Asp Phe Met Gln Asp Lys Leu Glu Asp Asn Pro Asp Tyr
                165
                                    170
Phe Tyr Lys Glu Thr Ala Phe Leu Gln Val Phe Leu Asn Phe Met Gln
                                185
Pro Ser Thr Ser Glu Asn Ala Glu Glu Glu Glu Glu Ala Glu Ser Leu
                            200
Asp
<210> 5313
<211> 200
<212> PRT
<213> B.fragilis
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Tyr Phe Cys Thr Leu Phe Ser Gln Glu Ile Asp Gln Glu Met Ile Glu
Asp Ile Lys Lys Ala Cys Gln Val Met Ser Glu Gly Gly Val Ile Leu
                                25
Tyr Pro Thr Asp Thr Val Trp Gly Ile Gly Cys Asp Ala Thr Asn Glu
Asp Ala Val Arg Arg Val Tyr Glu Ile Lys Arg Arg Ala Asp Ser Lys
Ala Met Leu Val Leu Val Asp Ser Pro Val Lys Val Glu Phe Tyr Val
Gln Asp Val Pro Ser Val Ala Trp Asp Leu Ile Glu Val Ala Asp Lys
                                    90
Pro Leu Thr Ile Ile Tyr Ser Gly Ala Arg Asn Leu Ala Ser Asn Leu
                                105
Leu Ala Glu Asp Gly Ser Val Gly Ile Arg Val Thr Asn Glu Ala Phe
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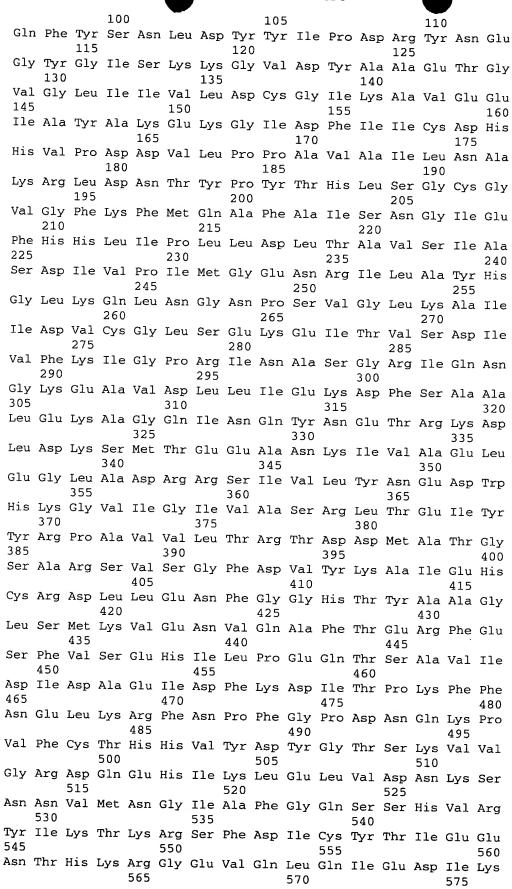
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Leu Tyr Leu Pro Val Met His Leu Ser Trp Ser His Asn Ile Val Leu
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Lys Leu Pro Phe Thr Thr Lys Ala Asp Met Arg Ala Asn Tyr Pro Phe
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Gly Leu Val Ala Gly Asn Met Lys Glu Asp Gly Val Arg Ile His Ser
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Ser Ser Gly Thr Thr Gly Thr Pro Thr Val Ile Val His Ser Gln His
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Asp Leu Asp Ser Trp Ala Asn Leu Val Ala Arg Cys Leu Tyr Cys Val
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Gly Ile Arg Asn Thr Asp Val Phe Gln Asn Ser Ser Gly Tyr Gly Met
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Phe Thr Gly Gly Leu Gly Phe Gln Tyr Gly Ala Glu Arg Leu Gly Ala
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Leu Thr Val Pro Ala Ala Ala Gly Asn Ser Lys Arg Gln Ile Lys Phe
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                                                         175
Ile Thr Asp Phe Lys Thr Thr Ala Leu His Ala Ile Pro Ser Tyr Ala
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Gln Arg Lys Lys Ile Glu Arg Met Leu Gly Val Lys Ala Tyr Asn Ser
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Phe Gly Met Thr Glu Met Asn Gly Pro Gly Val Ala Phe Glu Cys Thr
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Glu Gln Asn Gly Met His Phe Trp Glu Asp Cys Tyr Tyr Val Glu Ile
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Val Lys His Ile Glu Lys Phe Leu Val Glu Met Gly Ala Gly Phe Ala 75 70

Phe Met Gly Arg Gln Tyr Tyr Ile Glu Val Ser Gly Asn Asp Phe Tyr 90

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Phe Tyr Cys Ser Val Val Asp Asp Ile Leu Cys Arg Ala Gly Asp Asn 135 140 130

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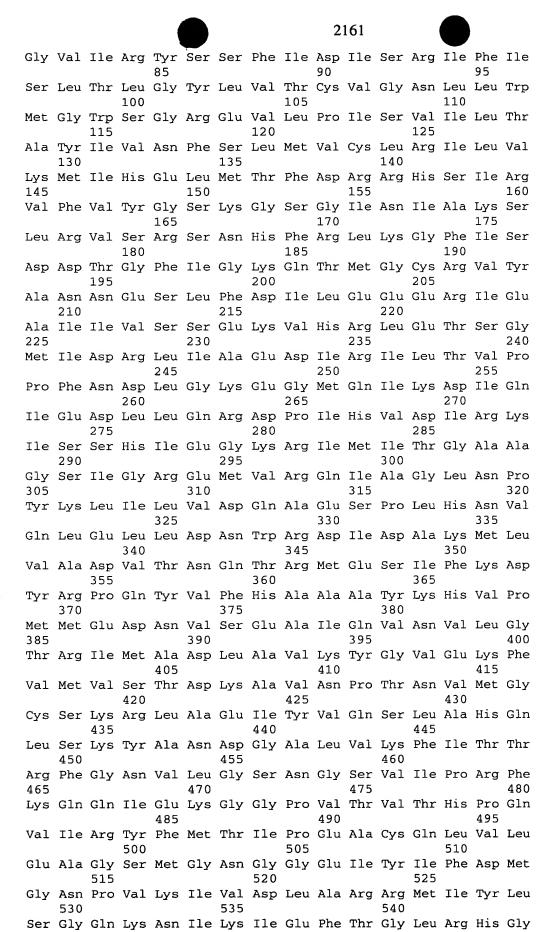
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Cys Val Ile Phe Asn Val Cys Phe Phe His Leu Asn Arg Thr Tyr Val



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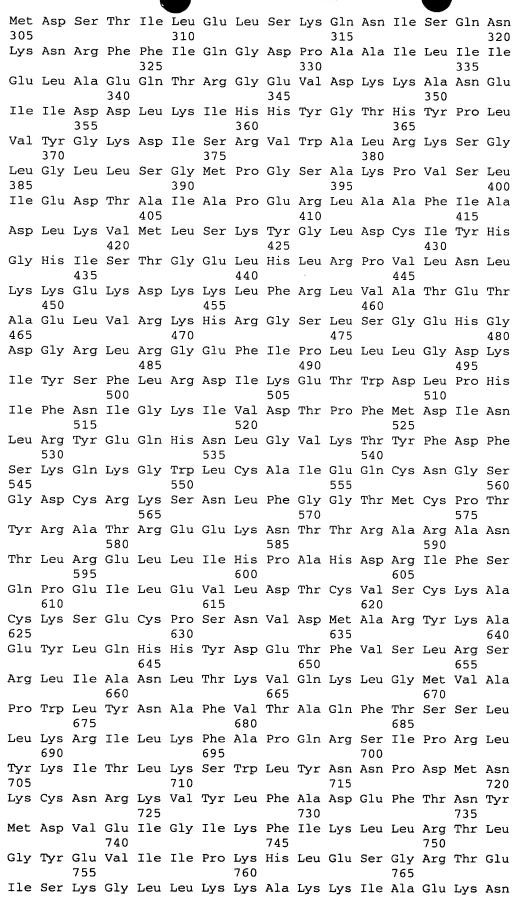
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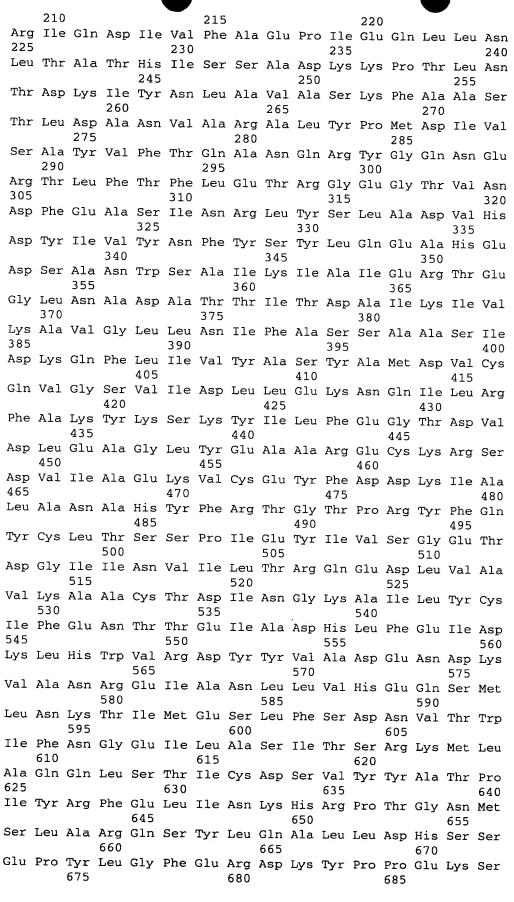
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Val Pro Gly Thr Tyr Ala Leu Ser Ala Phe Ser Ser Val Phe His Ala Leu Tyr Arg Ala Gly Gly Val Asn Lys Ile Gly Ser Leu Arg Ser Ile Lys Val Val Arg Asn Gly Lys Lys Ile Ala Asp Leu Asp Val Tyr Asp Phe Ile Met Lys Gly Lys Leu Asn Asp Val Arg Leu Gln Asp Gly Asp Val Val Ile Val Asp Pro Tyr Glu Ser Leu Val Gln Ile Thr Gly Lys Val Lys Arg Pro Met Phe Tyr Glu Met Lys Pro Ser Glu Thr Met . 380 Ala Thr Ile Leu Lys Tyr Ser Gly Gly Phe Thr Gly Asp Ala Tyr Lys Lys Ala Ile Arg Leu Ile Arg Lys Thr Gly Arg Glu His Gln Val Tyr Asn Val Asp Glu Met Asp Tyr Ser Val Phe Lys Leu Asp Asp Gly Asp Val Leu Ala Val Asp Ser Val Leu Glu Arg Phe Glu Asn Arg Val Glu Val Arg Gly Ala Val Tyr Arg Ala Gly Met Tyr Gln Ile Asp Gly Thr Val Asn Thr Val Lys Gln Leu Ile Lys Lys Ala Glu Gly Val Arg Gly Asp Ala Phe Leu Asn Arg Ala Ile Ile Asp Arg Glu Asn Asp Asp Leu Thr His Glu Met Ile Gln Ile Asp Leu Lys Gly Leu Leu Asn Gly Thr Val Ala Asp Ile Pro Leu Gln Lys Asn Asp Ile Leu Tyr Ile Pro Ser Ile Glu Asp Leu Lys Glu Glu Ala Thr Leu Thr Ile His Gly Glu Val Ala Asn Pro Gly Thr Tyr Leu Tyr Ser Ser Asn Met Ser Val Glu Asp Leu Val Leu Gln Ala Gly Gly Leu Leu Glu Ala Ala Ser Thr Ala Arg Val Asp Val Ser Arg Arg Ile Lys Asn Ser Lys Ser Thr Glu Leu Ser Asn Val Val Gly Lys Thr Phe Ser Phe Glu Leu Lys Asp Gly Phe Leu Val Gly Gly Asp Gln Asp Phe His Leu Glu Pro Phe Asp Glu Val Tyr Ile Arg Arg Ser Pro Ala Tyr His Gln Gln Asn Val Thr Val Gly Gly Glu Val Leu Phe Gly Gly Arg Tyr Ala Leu Ser Lys Lys Asn Glu Arg Leu Ser Asp Leu Ile Ser Lys Ala Gly Gly Ile Thr Gln Asp Ala Tyr Val Lys Gly Ala Arg Leu Ile Arg Lys Met Thr Glu Glu Glu Leu Arg Arg Lys Glu Asp Ala Leu Arg Met Ala Asn Lys Gly Gly Ala Asp Ser Ile Ser Val Lys Thr Leu Asp Val Ser Asp Thr Tyr Ser Val Gly Ile Glu Leu Glu Lys Ala Leu Ala Asn Pro Gly Ser Asp Phe Asp Met Val Leu Arg Glu Gly Asp Ile Leu Phe Val Pro Glu Tyr Val Ser Thr 

Val Lys Ile Asn Gly Ala Val Met Tyr Pro Asn Thr Val Leu Tyr Lys 760 765 Lys Gly Glu Ser Leu Lys Tyr Tyr Ile Asn Gln Ala Gly Gly Phe Ala 775 780 Ser Leu Ala Lys Lys Lys Arg Ala Phe Val Val Tyr Met Asn Gly Thr 790 795 Val Ser Arg Leu Arg Thr Gly Asn Ser Lys Ala Ile Glu Pro Gly Cys 805 810 Glu Ile Ile Val Pro Ser Lys Asp Pro Lys Lys Arg Met Ser Ala Ala 825 Glu Ile Ile Gly Met Gly Thr Ser Ala Ala Ser Leu Ala Thr Met Ile 840 Ala Thr Met Val Asn Leu Phe Lys 850 <210> 5326 <211> 965 <212> PRT <213> B.fragilis <400> 5326 Met Asn Phe Gln Asp Leu His Ile Leu Gly Glu Leu Lys Glu Glu Leu Leu Tyr Arg Ile Leu Tyr Ser Thr Asp Ala Ser Ala Tyr Arg Glu Met 25 Pro Ile Ala Val Ala Tyr Pro Lys Asp Ser Ser Asp Val Gln Lys Ile Ser Asn Phe Ala Lys Lys Asn Gln Ile Asn Leu Ile Pro Arg Ala Gly 55 Gly Thr Ser Leu Ala Gly Gln Val Val Gly Lys Gly Leu Val Val Asp 70 Ile Ser Lys Tyr Met Asn His Ile Leu Glu Ile Asn Gln Glu Glu Arg 85 90 Trp Val Arg Val Gln Pro Gly Val Val Leu Asp Glu Leu Asn Leu Tyr 100 105 Cys Lys Pro Tyr Gly Leu Phe Phe Gly Pro Glu Thr Ser Thr Ser Asn 120 Arg Cys Cys Leu Gly Gly Met Val Gly Asn Asn Ser Cys Gly Ser His 135 Ser Leu Val Tyr Gly Ser Thr Arg Asp His Leu Leu Glu Ala Asn Val 150 155 Val Leu Ser Asp Gly Ser Glu Val Val Leu Lys Gly Met Thr Ser Lys 165 170 Glu Ile Asn Glu Lys Cys Lys Leu Asp Ser Leu Glu Gly Arg Ile Tyr 185 Ser Gln Ile Ile Thr Leu Leu Ser Asn Phe Glu Asn Gln Lys Glu Ile 195 200 Val Asp Asn Tyr Pro Asp Val Ser Leu Arg Arg Arg Asn Ser Gly Tyr 215 220 Ala Ile Asp Glu Leu Leu Arg Ser Asn Tyr Phe Asp Lys Asn Cys Ser 230 235 Glu Ser Phe Asn Leu Cys Lys Leu Leu Ala Gly Ser Glu Gly Thr Leu 250 Ala Leu Ile Thr Glu Leu Lys Leu Lys Leu Val Pro Leu Pro Pro Thr 265 Glu Lys Ala Val Ile Cys Val His Cys Ser Thr Leu Glu Glu Ser Phe 280 Ala Ala Asn Leu Val Ala Leu Arg His Ala Pro Val Ala Ile Glu Leu 290 295 300



775 780 Ile Leu Phe Leu Lys Asp Ile Val Thr Glu Glu Ile Pro Leu Val Gly 790 795 Ile Glu Pro Ser Cys Ile Leu Ser Phe Arg Asp Glu Tyr Pro Asp Leu 805 810 Val Asp Glu Glu Leu Gln Gly Tyr Ala Arg Lys Leu Ser Val Asn Cys 825 Leu Leu Tyr Asp Glu Phe Ile Val Arg Glu Met Arg Lys Gly Asn Ile 840 Lys Gln Lys Gln Phe Thr Gln Ser Tyr Leu Tyr Ile Lys Leu His Gly 855 His Cys His Gln Lys Ser Leu Ala Ser Ile Glu Pro Ser Lys Glu Met 870 875 Leu Ser Leu Pro Lys Asn Tyr Gln Val Asp Ile Ile Pro Ser Gly Cys 890 Cys Gly Met Ala Gly Ala Phe Gly Tyr Glu Lys Glu His Tyr Asp Leu 900 905 Ser Met Gln Ile Gly Glu Gln Val Leu Phe Pro Ala Ile Arg Gln Ala 920 Lys Glu Asp Val Cys Ile Ser Ala Pro Gly Thr Ser Cys Arg Gln Gln 935 940 Ile Lys Asp Gly Thr Gly Arg Arg Ala Tyr His Pro Ile Glu Val Leu 955 Tyr Asp Ala Leu Ile <210> 5327 <211> 1084 <212> PRT <213> B.fragilis <400> 5327 Ala Thr Leu His His Glu Arg Ala Asp Arg Gln Val Ala Gly Ser Gln 5 10 Gln Val Leu Ser Ser Asn Met Ser Phe Thr Thr Ser Ile Asn Ile Glu 25 Arg Asp Phe Gly Lys Ile Pro His Tyr Ile Val Thr Ala Asn Ala Arg 40 Gln Thr Ile Gly Lys Ile Ile Asn His Phe Ala Ser Gly Ile His Ser Phe Cys Leu Ile Gly Ser Tyr Gly Thr Gly Lys Ser Ser Phe Ile Leu 70 75 Ala Leu Glu Asn Cys Leu Cys Gly Lys Thr Val Gly Lys Asn Val Leu 90 Leu Ser Gln Arg Gly Gln Phe Asn Ser Phe Glu Gln Phe Ser Phe Ile 105 Asn Ile Val Gly Asp Tyr Ala Ser Leu Ala Asn Leu Leu Ala Ser His 120 125 Leu Asn Ala Glu Ser Lys Asn Val Ile Ser Val Leu Asp Asn His Tyr 135 Asn Arg Leu Gln Lys Thr Asn Gln Phe Leu Val Ile Val Ile Asp Glu 155 Phe Gly Lys Val Leu Glu His Ala Ala Lys Asn Asn Pro Glu Lys Glu 165 170 Met Tyr Phe Leu Gln Lys Phe Cys Glu Tyr Val Asn Asp Thr Ser Lys 185 Asn Ile Leu Phe Leu Thr Thr Leu His Gln Gly Phe Gly Ala Tyr Ala 200 Lys Gly Leu Lys Ala Glu Gln Lys Gln Glu Trp Thr Lys Val Lys Gly



Leu Tyr Leu Thr Leu Leu Lys Asn Thr Gly Ile His Thr Thr Ala Gly 695 700 Leu Gly Ser Pro Thr Glu Pro Ser Phe Gln Pro Leu Trp Asp Ala Cys 710 715 Glu Asn Phe Leu Arg Ser Thr Ile Gly Lys Pro His Lys Leu Gly Glu 725 730 Leu Phe Thr Leu Leu Glu Ala Ala Pro Phe Arg Leu Lys Gln Gly Leu 745 Leu Tyr Cys Trp Ile Pro Thr Tyr Leu Ile Ile Lys Arg Asp Asp Phe 760 Ala Leu Tyr Asn Ser Asp Gly Thr Tyr Val Pro Tyr Ile Asn Lys Glu 775 780 Val Leu Asp Leu Ile Leu Arg Ser Pro Asn Gly Phe Leu Ile Lys Ala 790 795 Phe Ala Val Asp Gly Val Arg Arg Thr Phe Phe Asp Lys Tyr Arg Glu 810 Ala Ile Asn Met Gly Ser Ser Glu Leu Ser Thr Gln Ser Phe Ile Glu 820 825 Thr Ile Arg Pro Phe Leu Thr Phe Tyr Lys Lys Leu Asn Ser Tyr Ala 840 Arg Arg Thr Lys Asp Ile Ser Pro Asn Ala Arg Lys Phe Arg Asp Val 855 860 Ile Ala Lys Ala Thr Asp Pro Glu Lys Thr Phe Phe Glu Val Leu Pro 870 875 Asp Glu Leu Gly Phe Lys Glu Ile Thr Leu Ser Gln Asn Pro Glu Ala 885 890 Ile Glu Ser Phe Val Ala Val Ile Gln Glu Ala Ile Arg Glu Leu Arg 905 Asn Cys Tyr Ser Glu Leu Val Gly Asn Ile Glu Gln Tyr Leu Leu Lys 920 925 Thr Leu Arg Leu Glu Glu Val Gly Phe Ser Asp Tyr His His Leu Ile 935 940 Ala Glu Arg Tyr Lys Ser Val Lys Thr Glu Leu Met Pro Val Asn Met 950 955 Arg Asn Phe Gln Ala Arg Leu Val Gly Asn Tyr Asp Asp Lys Thr Ala 965 970 Trp Ile Glu Ala Val Ser Tyr Val Ala Leu Asn Lys Pro Leu Thr Glu 985 Ile Arg Asp Thr Asp Lys Ser Phe Leu Leu Ala Thr Leu Lys Asp Met 1000 Leu Phe Gln Leu Asp Asp Tyr Val Glu Met His Lys Thr Ala Ser Glu 1015 1020 Asp Val Ile Arg Leu His Ile Thr Gln Asn Lys Ser Lys Ala Val Thr 1030 1035 Thr Gln Val Ile Leu Ser Glu Ala Met Arg Gln Glu Val Asn Ser Leu 1045 1050 Glu Asn Lys Leu Glu Ser Ile Leu Ser Gly Asp Asn Ser Leu Asp Val 1060 1065 Ala Ala Leu Ile Ala Ile Leu Lys Lys Lys Leu Lys 1075 1080 <210> 5328 <211> 88 <212> PRT <213> B.fragilis <400> 5328 Phe Tyr Ser His Cys Val Asp Gln His Cys Lys Gly Glu His Leu Gln 10

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Ser Tyr Asn His His Ile Ile Ser Ala Ile Thr Tyr Phe Phe Leu Tyr
35 40 45

Ile Tyr Phe Thr Tyr Ser Ala Ile Val Arg Leu Phe Ile Leu Tyr Pro 50 55 60

Phe Asn Glu Ile Ser Pro Val Leu Tyr Leu Ala Trp His Lys Thr Gly 70 75 80

Asp Glu Thr Lys Ile Tyr Thr His

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<213> B.fragilis

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Glu Ala Asn Val Ile Leu Trp Ile Ser Arg Asn Ser Leu Lys Ile Ser 20 25 30

Leu Ala Asp Ile Glu Ser Ser Pro Tyr Ile Ser Lys Gln Leu Leu Arg 35 40 45

His Thr Leu Glu His Leu Gln Glu Leu Asp Phe Ile Glu Ser Thr Gly 50 55 60

Arg Ala Ser Gly Leu Arg Tyr Ile Leu His Lys Ser Lys Ile Gln Thr 65 70 75 80

Thr Gly Glu Lys Ile Lys Tyr Ser Gln Leu Lys Arg Gln Gly Lys Ala 85 90 95

Lys Gln Arg Glu Ala Val Ile Arg Tyr Ile Asn Thr Val Gly Thr Ile  $100 \\ 105 \\ 110$ 

Thr Asn Ala Glu Ala Arg Glu Ile Leu Asn Leu Thr Glu Thr Ser Gln
115 120 125

Ser Tyr Val Pro Arg Cys Tyr Pro Asn Tyr Gly Val Lys Asp Ile 130 135 140

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<213> B.fragilis

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Gly His Glu Ser Phe Gln Cys Lys Gly Leu Trp Leu Lys Lys Gly Tyr 20 25 30

Asp Tyr Ala Lys Ala Gly Leu Ser Phe Thr Asp Asp Tyr Ala Val Val 35 40 45

Glu Leu Gly Val Gly Lys Asn Met Val Ala Ser Ile Arg Tyr Trp Leu 50 55 60

Arg Ala Phe Gly Ile Thr Asn Asp Asn Gly Val Pro Thr Glu Ile Gly 65 70 75 80

Lys Tyr Leu Leu Asp Asp Asn Gly Ala Asp Pro Tyr Ile Glu Asp Thr 85 90 95

Thr Thr Leu Trp Leu Leu His Tyr Met Leu Val Thr Ser Arg Val Ala 100 105 110

Thr Leu Tyr Asn Ile Val Phe Thr Glu Tyr Asn Lys Thr Arg Lys Glu
115 120 125

Phe Thr Lys Ala Asp Leu Ala Asn Ala Val Arg Arg Met Phe Ala Asp

135 140 Lys Cys Phe Asp Ser Thr Pro Tyr Asn Glu Lys Thr Val Trp Arg Asp 150 155 Ile Asp Thr Met Leu Lys Asn Tyr Val Thr Pro Asp Ser Ile Lys Ala 170 165 Cys Asp Asp Phe Ser Ala Leu Leu Ile Asp Leu Lys Leu Ile Gly Lys 185 Thr Gly His Glu Asp Tyr Thr Phe Asn Cys Ser Ala Arg Ala Lys Met 205 200 Glu Pro Leu Val Phe Leu Phe Ala Val Leu Asp Ile Thr Gln Gly Lys 215 Gln Gln Val Ile Glu Phe Glu Val Leu Leu Arg Leu Ala Asn Ile Phe 230 235 Gly Met Ser Val Asn Glu Leu Tyr Asp Val Phe Asp Gln Leu His Thr 250 245 Ile Asp Pro His Ile Thr Phe Cys Asn Thr Ala Gly Glu Gln Leu Phe 265 260 Thr Met Lys Glu Arg Ile Asp Lys Trp Gln Val Leu Asn Lys Tyr Tyr 280 Gln Ala Thr 290

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 Leu
 Leu
 Lys
 Lys
 Val
 Ser
 Val
 Ser
 Ile
 Asn
 Asp
 Asp

 Arg
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 Ile
 Glu
 Arg
 Lys
 Asp
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 Gly
 Tyr
 Phe
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 Leu</

Phe Asn Lys Lys Asn Val Phe Leu His Gly Leu Ile Tyr Leu Ile Val 50 55 60

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<400> 5334

Asp Met Ser Lys Gln Leu Leu Gly Asp Glu Ala Ile Ala Gln Ala 10 Ala Leu Asp Ala Gly Leu Ser Gly Val Tyr Ala Tyr Pro Gly Thr Pro 25 Ser Thr Glu Ile Thr Glu Tyr Ile Gln Met Ala Pro Ile Thr Ser Glu Arg Asn Ile His Asn Arg Trp Cys Ala Asn Glu Lys Thr Ala Met Glu 55 Ala Ala Leu Gly Met Ser Phe Val Gly Lys Arg Ala Leu Val Cys Met 75 Lys His Val Gly Met Asn Val Ala Ala Asp Cys Phe Ile Asn Ser Ala 85 90 Ile Thr Gly Val Lys Gly Gly Leu Ile Val Val Ala Ala Asp Asp Pro 105 Ser Met His Ser Ser Gln Asn Glu Gln Asp Ser Arg Phe Tyr Gly Asp 120 Phe Ser Leu Ile Pro Met Tyr Glu Pro Ser Asn Gln Gln Glu Ala Tyr 135 Asp Met Val Tyr Asn Gly Phe Glu Phe Ser Glu Lys Ile Gly Glu Pro 150 155 Ile Leu Met Arg Met Val Thr Arg Leu Ala His Ser Arg Ser Gly Val 165 170 Glu Asn Lys Ala Gln Lys Pro Gln Asn Glu Ile Ser Phe Ser Glu Asp 185 Pro Arg Gln Phe Ile Leu Leu Pro Gly Asn Ala Arg Lys Arg Tyr Lys 200 Val Leu Leu Thr Arg Gln Glu Glu Phe Ile Lys Ala Ser Glu Glu Ser 215 220 Pro Tyr Asn Arg Tyr Ile Asp Gly Pro Asn Lys Lys Thr Gly Ile Val 230 235 Ala Cys Gly Ile Gly Tyr Asn Tyr Leu Met Glu Asn Tyr Pro Glu Gly 245 250 Cys Glu Tyr Pro Val Leu Lys Val Gly Gln Tyr Pro Leu Pro Lys Lys 265 Gln Leu Met Gln Leu Ile Asp Ala Cys Asp Glu Ile Leu Val Leu Glu 280 Asp Gly Gln Pro Phe Val Glu Lys Gln Leu Lys Gly Tyr Leu Gly Ile 295 Gly Leu Lys Val Lys Gly Arg Leu Asp Gly Thr Leu Ser Gln Asp Gly

310 315 Glu Leu Asn Pro Asp Thr Val Ala Arg Ala Leu Gly Lys Glu Asn Ser 330 Ser Glu Phe Asn Val Pro Asn Ile Val Glu Met Arg Pro Pro Ala Leu 345 Cys Glu Gly Cys Gly His Arg Asp Met Tyr Ile Thr Leu Thr Gln Val 360 Leu Lys Glu Glu Tyr Pro Thr His Lys Val Phe Ser Asp Ile Gly Cys 375 Tyr Thr Leu Gly Ala Asn Ala Pro Phe Asn Ala Ile Asn Ser Cys Val 395 Asp Met Gly Ala Ser Ile Thr Met Ala Lys Gly Ala Ser Asp Gly Gly 405 410 Leu His Pro Ala Val Ala Val Ile Gly Asp Ser Thr Phe Thr His Ser 425 420 Gly Met Thr Gly Leu Leu Asp Cys Val Asn Glu Asn Ala Asn Val Thr 440 Ile Val Ile Ser Asp Asn Glu Thr Thr Ala Met Thr Gly Gly Gln Asp 455 Ser Ala Gly Thr Gly Arg Leu Glu Ala Ile Cys Ala Gly Leu Gly Val 475 470 Asp Pro Ala His Ile Arg Val Val Val Pro Leu Lys Lys Asn Tyr Glu 490 Glu Met Lys Gln Ile Ile Arg Glu Glu Ile Asn Tyr Lys Gly Val Ser 505 Val Ile Ile Pro Arg Arg Glu Cys Ile Gln Thr Leu Ala Arg Lys Lys 520 Arg Ser Lys 530 <210> 5335 <211> 142 <212> PRT <213> B.fragilis <400> 5335 Ile Leu Ser Asn Arg Asn Thr Phe Asp Pro Thr Tyr Leu Trp Gly Asp 10 Asn Leu Ser Ile Asn Pro Leu Asn His Ile Arg Met Lys Gln Lys Lys Arg Pro Ala Ser Gln Thr Glu Ala Met Lys Leu Arg Trp Lys Lys Arg 40 Ile Val Phe Glu Lys Gly Tyr Thr Glu Met Cys Ala Glu Trp Met Ala 55 Glu Arg Leu Glu Ala Leu Thr Asp His Leu Gln Tyr Gly His Ala Ala 75 Ile Ala Tyr Gln Lys Gln Asn Gly Asp Phe Arg Leu Val Lys Ala Thr 90 Leu Ile Tyr Tyr Glu Thr Glu Phe His Lys Lys Tyr Asp Pro Thr Gln 100 105 Ile Glu Gly Ala Val Val Tyr Trp Asn Val Asp Glu Gln Arg Trp Thr 120 Thr Phe Gln Met Glu Asn Phe Met Glu Trp Arg Pro Ile Val 135 <210> 5336 <211> 410 <212> PRT

<213> B.fragilis

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<212> PRT

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20 25 30
Tyr Asp Thr Phe Asp Ser Val Gly Ile Met Asp Ser Phe Pro Glu

40 Ser Ser Phe Phe Val Glu Glu Glu Leu Phe Asp Arg His Cys Thr Lys 55 Leu Lys Gly Thr Asp Lys Gln Ile Asp Phe Leu Ser Ile Cys Thr Pro 70 Asn Tyr Leu His Asp Ala His Met Arg Tyr Gly Leu Arg Leu Gly Ala 90 Asp Val Ile Cys Glu Lys Pro Leu Val Leu Asn Pro Trp Asn Val Asp 105 Ala Leu Gln Glu Val Glu Arg Glu Thr Gly His His Ile Tyr Thr Ile 120 Leu Gln Leu Arg Leu His Gln Ser Ile Ile Asp Leu Lys Lys Lys Ile 135 Glu Asn Gly Pro Lys Asp Lys Ile Tyr Asp Val Asp Leu Thr Tyr Ile 155 150 Thr Ser Arg Gly Asn Trp Tyr Tyr Thr Ser Trp Lys Gly Asp Met His 170 165 Lys Ser Gly Gly Ile Ala Thr Asn Ile Gly Val His Phe Tyr Asp Met 185 Leu Ser Trp Val Phe Gly Pro Val Lys Lys Asn Ile Val His Val Tyr 200 Thr His Asp Arg Ala Ala Gly Tyr Leu Glu Leu Glu Lys Ala Arg Val 220 215 Arg Tyr Phe Leu Ser Ile Asn Ser Glu Asn Leu Pro Glu Asn Ala Val 235 230 Gln Gly Glu Lys Leu Thr Tyr Arg Thr Ile Asn Ile Asp Gly Glu Glu 250 245 Phe Glu Phe Ser Lys Gly Phe Thr Glu Leu His Thr Glu Ser Tyr Lys 265 Asp Ile Leu Ala Gly Asn Gly Phe Gly Ile Glu Asp Ala Arg Asn Ala 280 Ile Asn Ile Val Tyr Asp Ile Arg His Ala Glu Pro Ile Gly Leu Lys 295 300 Gly Asp Tyr His Pro Leu Ala Lys Leu Pro Leu Ser Lys His Pro Phe 315 310 Gly Trp

<210> 5340 <211> 89

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75

Phe Cys Phe Asp Val Phe Val Ile Cys 85

<210> 5341 <211> 376

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360

365

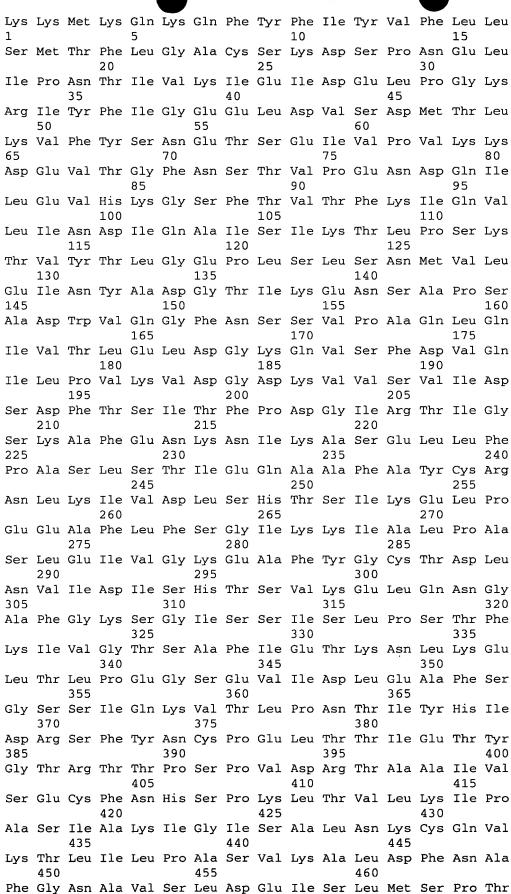
Arg Arg Val Val Asp Met Ile Arg 370 375

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<213> B.fragilis

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485 490 490 495

Arg Val Pro Gln Asn Leu Val Glu Thr Tyr Lys Gln Asn Lys Ala Trp
500 505 510

Lys Pro Phe Ala Glu Lys Ile Val Ala Leu

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<213> B.fragilis <400> 5343 Ile Met Lys Lys Glu Asp Leu Arg Ile Val Tyr Met Gly Thr Pro Asp Phe Ala Val Glu Ala Leu Gln Cys Leu Val Glu Gly Gly Tyr Asn Val 25 Val Gly Val Ile Thr Met Pro Asp Lys Pro Ala Gly Arg Gly His Lys 40 Ile Gln Tyr Ser Pro Val Lys Gln Tyr Ala Leu Asp His Gln Leu Pro 55 Leu Leu Gln Pro Glu Lys Leu Lys Asp Glu Glu Phe Ile Gln Ala Leu 70 Arg Glu Trp Lys Ala Asp Leu Gln Ile Val Val Ala Phe Arg Met Leu 90 Pro Glu Val Val Trp Asn Met Pro Arg Leu Gly Thr Phe Asn Leu His 105 Ala Ser Leu Leu Pro Gln Tyr Arg Gly Ala Ala Pro Ile Asn Trp Ala 120 125 Val Ile Asn Gly Asp Thr Glu Thr Gly Ile Thr Thr Phe Phe Leu Lys 140 135 His Glu Ile Asp Thr Gly Glu Val Ile Gln Gln Val Arg Ile Pro Ile 150 155 Ala Asp Thr Asp Asn Val Glu Ile Val His Asp Lys Leu Met His Leu 165 170 Gly Gly Arg Leu Val Ile Glu Thr Val Asp Ala Ile Leu Glu Gly Lys 185 Val Lys Ser Ile Pro Gln Glu Glu Met Ala Val Ala Gly Glu Leu Arg 200 Pro Ala Pro Lys Ile Phe Lys Glu Thr Cys Arg Ile Asp Trp Asn Gln 215 220 Pro Val Lys Arg Val Tyr Asp Phe Ile Arg Gly Leu Ser Pro Tyr Pro 230 235 Ala Ala Trp Ser Glu Leu Val Asn Pro Glu Gly Glu Ala Val Val

245 250 255

Lys Ile Phe Glu Ser Glu Lys Leu Pro Lys Val His Thr Leu Ala Pro 260 265 270

Gly Ser Ile Val Thr Asp Gly Lys Asn Phe Leu Arg Val Ala Val Pro 275 280 285

Asp Gly Phe Val Asn Val Leu Ser Leu Gln Leu Pro Gly Lys Lys Arg 290 295 300

Leu Lys Thr Asp Glu Leu Leu Arg Gly Phe His Leu Thr Glu Ala Phe 305 310 315 320 Lys Met Lys Ala Val

Lys Met Lys Ala Val

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<212> PRT <213> B.fragilis

<400> 5344

Arg Phe Ile Glu Arg Met Glu Glu Thr Ala Arg Lys Ile Lys Glu Asn 10 Thr Ser Cys Trp Tyr Ala Val Tyr Thr Ala Pro Arg Ala Glu Lys Lys Val Lys Glu Gln Leu Asp Lys Ile Gly Val Glu Asn Tyr Leu Pro Leu 40 Gln Pro Val Val Arg Leu Trp Asn Asn Arg Lys Lys Ile Phe Ile 55 Pro Val Val Pro Gly Cys Leu Phe Val His Ile Ser Ser Glu Glu Ile 70 75 Ala His Val Ala Gly Ile His Gly Val Ala Phe Leu Leu Lys Glu Lys 90 Gly Gln Tyr Val Ser Ile Pro Glu Val Gln Met Glu Thr Phe Lys Thr 105 Met Ile Glu His Ser Cys Glu Leu Val Glu Phe Ala Pro Asn Glu Phe 120 Val Pro Gly Thr Ile Val Arg Val Ile Ser Gly Gln Leu Gln Gly Leu 135 Glu Ala Glu Leu Val Asp Cys Gln Gly Asn Asn Lys Leu Leu Leu Arg 150 155 Val Glu Gly Leu Gly Cys Ala Leu Val Thr Val Ser Thr Asp Cys Val 165 170

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<212> PRT

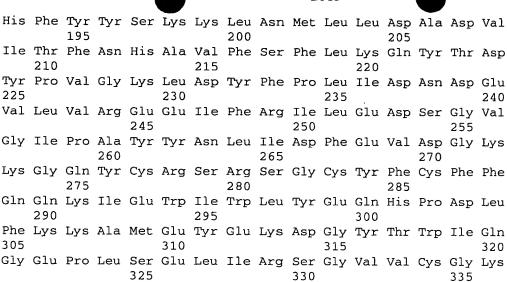
<213> B.fragilis

Ala Ser Lys Glu Glu

180

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Ser Ser Leu Thr Arg 340

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<400> 5346

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2184 Ile Ser Ser Leu Arg Leu Glu Gln Lys Val Phe Phe His Thr Ala Val 260 265 Glu His Ser Ile Leu Trp Glu Tyr Ile Gly Ser Val Asp Val Glu Leu 280 285 Ser Val Ile Leu Asn Thr Cys Ile Ser Tyr Tyr Tyr Ala Leu Pro Asn 295 300 Lys Ile Phe Glu Ser Ile Gln Ala Met Ile Pro Leu Ile Val Ser Asp 310 315 Phe Pro Glu Met Glu Arg Val Val Lys Met Tyr Asp Ile Gly Val Cys 325 330 Cys Lys Ser Asp Asp Val Asn Ser Leu Val Glu Ala Ile Arg Leu Met 345 Asn Lys Asp Lys Val Leu Tyr Ser Arg Phe Lys Ala Asn Met Gln Asp 360 Ala Lys Lys Glu Leu Cys Trp Glu Asn Glu Lys Glu Ile Leu Glu Gly 375 380 Ala Tyr Arg Ser Ile Leu Met Asp Ile 390

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<400> 5347

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Phe Gly Lys Leu Ser Asn Pro Tyr Lys Lys Leu Ala Leu Gly Gly Val 280 Met Leu Ser Val Leu Ile Phe Leu Phe Pro Pro Leu Tyr Gly Glu Gly 295 300 Tyr Asp Thr Ile Glu Leu Leu Asn Gly Val Ser Asn Ala Asp Trp 310 315 Asp Thr Val Leu Asn Asn Ser Leu Phe Tyr Gly Tyr Gly Asn Leu Leu 330 Leu Val Tyr Leu Val Leu Ile Ile Leu Leu Lys Val Phe Ala Ser Ser 345 Ala Thr Asn Gly Gly Gly Cys Gly Gly Ile Phe Ala Pro Ser Leu 360 Tyr Leu Gly Cys Ile Ala Gly Phe Val Phe Ser His Phe Ser Asn Asp 375 Phe Asp Phe Thr Ser Thr Leu Pro Glu Lys Asn Phe Ala Leu Met Gly 395 390 Met Ala Gly Val Met Ser Gly Val Met His Ala Pro Leu Thr Gly Val 405 410 Phe Leu Ile Ala Glu Leu Thr Gly Gly Tyr Asp Leu Phe Leu Pro Leu 425 Met Ile Val Ser Val Ser Ser Tyr Leu Thr Ile Ile Val Phe Glu Pro 435 440 445 His Ser Ile Tyr Ser Met Arg Leu Ala Lys Lys Gly Gln Leu Leu Thr 455 His His Lys Asp Lys Ala Val Leu Thr Leu Met Lys Val Glu Asn Val 470 475 Val Glu Thr Asp Phe Val Ser Val Arg Pro Glu Met Asp Leu Gly Glu 485 490 Leu Val Lys Ala Ile Ser Thr Ser His Arg Asn Met Phe Pro Val Thr 500 505 Asp Lys Asp Gly Val Leu Leu Gly Val Val Leu Leu Asp Asp Ile Arg 520 525 Asn Ile Met Phe Arg Gln Glu Leu Tyr His Arg Phe Thr Val Ser Lys 535 540 Leu Met Thr Ser Val Pro Ala Arg Leu Tyr Asp Thr Asp Ser Met Glu 550 555 Gln Val Met Gln Thr Phe Asp Asp Thr Lys Ala Trp Asn Leu Pro Val 565 570 Val Asn Glu Glu Gly Lys Tyr Leu Gly Phe Val Ser Lys Ser Lys Ile 585 Phe Asn Ser Tyr Arg Gln Val Leu Val His Phe Ser Glu Asp 600

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<211> 83

<212> PRT

<213> B.fragilis

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Ala Asn Trp

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Glu Ala Tyr Ala Lys Met Leu Val Lys Asn Gly Leu Gln Gly Val Phe
                             40
Ile Asn Gly Ser Ser Gly Glu Gly Tyr Met Leu Thr Asp Glu Glu Arg
                        55
                                            60
Met Lys Leu Ala Glu Arg Trp Val Glu Val Ser Pro Lys Gly Phe Lys
                    70
                                        75
Val Ile Val His Val Gly Ser Cys Cys Val Lys Ser Ser Arg Lys Leu
                                    90
Ala Glu His Ala Gln Lys Ile Gly Ala Trp Gly Ile Gly Ala Met Ala
                                105
Pro Pro Phe Pro Lys Val Gly Arg Val Glu Glu Leu Val Lys Tyr Cys
                            120
                                                125
Glu Glu Ile Ala Cys Gly Ala Pro Asp Leu Pro Phe Tyr Tyr His
                        135
                                            140
Ile Pro Ala Phe Asn Gly Ala Phe Leu Ser Met Val Ala Phe Leu Glu
                    150
                                        155
Ala Val Asp Gly Arg Ile Pro Asn Phe Ala Gly Ile Lys Tyr Thr Phe
                165
                                    170
Glu Ser Met Tyr Glu Tyr Asn Gln Cys Arg Leu Tyr Lys Gly Gly Lys
            180
                                185
Phe Asp Met Leu His Gly Gln Asp Glu Thr Ile Leu Pro Cys Leu Ala
                            200
Met Gly Gly Ala Gln Gly Gly Ile Gly Gly Thr Thr Asn Tyr Asn Gly
                        215
Val Asn Leu Val Gly Ile Ile Glu Ala Trp Lys Ala Gly Asp Leu Glu
                    230
                                        235
Lys Ala Arg Glu Leu Gln Asn Phe Ser Gln Glu Val Ile Asn Val Ile
                245
                                    250
Cys His Phe Arg Gly Asn Ile Val Gly Gly Lys Arg Ile Met Lys Leu
                                265
Ile Gly Leu Asp Leu Gly Lys Asn Arg Thr Pro Phe Gln Asn Met Thr
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Asp Asp Glu Glu Val Arg Met Lys Ala Glu Leu Glu Ala Ile His Phe
                        295
Phe Asp Arg Cys Asn Lys Phe
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55 60 Cys Leu Cys Tyr Ile Ser Phe Ala Tyr Ile Gly Ser Ile Leu Leu Asn 70 75 Ile Met His Phe Glu Ala Glu Asp Tyr Leu Gly Met Tyr Ala Arg Pro 85 90 Asp Ile Phe Phe Leu Val Trp Val Phe Thr Leu Leu Gly Leu Leu Phe 105 Leu Leu Cly Phe Ala Ile Ala Asn Ile Val Phe Lys Asn Ile Cys 115 120 Tyr Pro Arg Lys Asn Arg Asp Leu Gln Leu Ile Lys Val Ser Ile Ser 135 Cys Phe Asp Asn Ser Asn Lys Asn Phe Phe Val Ile Leu Phe Leu Phe 150 155 Ile Leu Ser Phe Phe Val Leu Leu Val Tyr Arg Asn Ala Ile Gly Gly 165 170 Phe Pro Leu Glu Ser Val Phe Ser Ala Asp Asn Gly Thr Ala Leu Ala 180 185 Phe Leu Arg Ser Glu Ala Thr Asn Asn Phe Ser Gly Lys Phe Tyr Arg 195 200 205 Tyr Val Met Phe Met Glu Thr Leu Pro Leu Phe Leu Phe Ile Val Val 215 220 Ser Phe Ile Lys Ser Cys Lys Lys Lys Trp Lys Tyr Leu Tyr Ile 230 235 Ala Leu Phe Leu Tyr Asn Leu Phe Tyr Ser Leu Ser Thr Ile Gln Lys 245 250 Ala Pro Ile Leu Lys Phe Leu Leu Cys Cys Ile Ile Phe Phe Tyr 265 Lys Asn Gly Phe Ile Asn Lys Lys Ile Ile Leu Lys Leu Val Val Phe 280 285 Ser Cys Gly Leu Val Leu Val Met Tyr Met Cys Phe Met Gly Leu Glu 295 Asp Ala Pro Ile Glu Val Ile Ile Glu Gly Ala Leu His Arg Val Phe 310 315 Ile Gly Ala Ile His Pro Phe Tyr Trp Tyr Ile Lys Tyr Ala Glu Glu 325 330 Phe Gly Phe Leu Tyr Gly Thr Ser Phe Pro Asn Pro Ala Gly Ile Phe 345 Pro Phe Glu Ser Phe Arg Leu Thr Val Glu Ile Met Asn Tyr Ala Lys 360 Gly Asp Leu Cly Asp Leu Val Gly Ser Met Pro Thr Val Tyr Ile 375 380 Gly Glu Met Tyr Ile Asn Phe Gly Leu Tyr Gly Leu Ala Leu Ala Ser 390 395 Leu Met Phe Gly Phe Ile Leu Gln Thr Leu Asp Ile Leu Phe Val Arg 405 410 Tyr Leu Leu Val Asn Lys Ser Val Leu Val Ser Ser Leu Tyr Ile Tyr 420 425 Met Ile Tyr Tyr Phe Ser Gln Phe Thr Glu Thr Gly Ile Ser Gly Ile 440 Ile Ile Asp Thr Asp Leu Tyr Ile Val Leu Phe Ile Ser Phe Ile Tyr 455 Cys Leu Ile Asn Arg Tyr Asn Leu Arg Arg Tyr Gly Lys Lys Lys Gly 470 475 Leu Pro Cys Tyr Lys Cys Thr Ser Cys Arg 485

<sup>&</sup>lt;210> 5352

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<sup>&</sup>lt;212> PRT

<213> B.fragilis

<400> 5352

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Ile Met Thr Leu Phe Glu Leu Phe Leu Asn Lys Leu Leu Tyr Arg Phe
20 25 30

Tyr Arg Ser Val Leu Ser Ser Phe Ser Ile Tyr Ser Leu Val Phe Ile
35 40 45

His His Ile Thr Arg Tyr Ala Ala His Lys Thr Gly Lys Tyr Leu Arg
50 55 60

Lys Gln Ile Ser Lys Gln Leu Arg Val Lys Phe Lys Gln Thr Ser Lys 65 70 75 80

Gly Asn Asp Phe Phe Ser Glu Trp Leu Pro Gly Phe Val Leu Leu Val
85 90 95

Cys Phe Asp Lys Val Leu Gly Asn Ser Tyr Leu Leu Asn Ser Trp Arg 100 105 110 Tyr Gly Val Ile Val Gly Ser Asn His Arg Arg Arg His

120

<210> 5353

<211> 70

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Leu Arg Gln Val Lys Ala Arg Val Ala Leu Ala Gln Lys Lys Ala Ile  $\frac{20}{25}$  30

Tyr Ala Ala Asn Gly Glu Met Leu Ser Met Tyr Trp Asp Ile Gly Lys 35 40 45

Leu Leu Ser Glu Ser Gln Thr Gln Ile Gly Trp Ala Thr Ile Arg Trp 50 55 60

Ser Ser Cys Pro Val Ile 65 70

<210> 5354

<211> 165

<212> PRT

<213> B.fragilis

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Thr Met Ala Thr Lys Ser Gly Asp Lys Lys Trp His Leu Asn Leu Val 20 25 30

Lys Val Gly Lys Val Val Ser Thr Gln Gln Leu Ala Glu Met Ile Ala 35 40 45

Glu Lys Ser Ser Leu Thr Pro Gly Asp Val His Asn Val Val Arg Asn 50 55 60

Leu Met Thr Ala Met Arg Ser Ala Leu Leu Asp Ser Lys Thr Val Arg 65 70 75 80

Leu Asp Gly Leu Gly Thr Phe Thr Met Lys Ala Arg Thr Arg Gly Arg 85 90 95

Gly Val Asp Lys Glu Glu Glu Val Asn Pro Asn Gln Val Ala Ala Leu
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Leu Cys His Phe Thr Pro Glu Tyr Thr Arg Pro Ala Ala Ile Gly Thr
115 120 125



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Trp Val Cys Lys Asp lie Arg Gly Arg lie Tyr Thr Gly Ala lie Gly
290 295 300

Leu Gly Leu Thr Ile Pro Ala Leu Leu Leu Gly Leu Gly Asn Gly
305 310 315 320

305 310 315 320
Phe Ile Ser Ile Val Gly Ala Gly Phe Leu Phe Gly Val Gly Phe Gly
325 330 335

Met Phe Asp Ala Asn Asn Met Pro Ile Leu Cys Gln Phe Val Ser Ala 340 345 350

Lys Tyr Arg Ala Thr Ala Tyr Gly Ile Met Asn Met Thr Gly Val Phe 355 360 365



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Lys Tyr Gly Leu Phe Ile Pro Glu Ile Ser Val Ser Leu Tyr Arg Thr 20 25 30

Ile Thr Ile Ile Ile Met Gln Asp Ile Ile Asn Gly Arg Cys Gly Trp 35 40 45

Cys Gly Ser Asp Glu Leu Tyr Val Lys Tyr His Asp Gln Glu Trp Gly 50 55 60

Lys Leu Val Thr Asp Asp Lys Thr Leu Phe Glu Phe Leu Val Leu Glu 65 70 75 80

Ser Ala Gln Ala Gly Leu Ser Trp Ile Thr Ile Leu Lys Lys Arg Glu

Gly Tyr Arg Lys Ala Phe Cys Asn Phe Asp Ala Glu Ser Val Ala Gln 100 105 110

Met Thr Asp Glu Asp Val Glu Arg Leu Met His Phe Asp Gly Ile Val 115 120 125

Lys Asn Arg Leu Lys Ile Lys Ser Thr Ile Thr Asn Ala Arg Ser Phe 130 135 140

Leu Ala Val Gln Lys Glu Phe Gly Ser Phe Tyr Asp Tyr Thr Leu Ser 145 150 155 160

Phe Phe Pro Asp Arg Lys Pro Ile Val Asn Thr Phe Gln Ser Leu Ser 165 170 175

Glu Ile Pro Val Ser Ser Pro Glu Ser Asp Ala Met Ser Lys Asp Met

180 185 190

Luc Luc Arg Cly Phe Luc Phe Phe Cly Thr Thr Tle Cys Tyr Ala His

Lys Lys Arg Gly Phe Lys Phe Phe Gly Thr Thr Ile Cys Tyr Ala His
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Leu Gln Ala Ser Gly Phe Met Asn Asp His Leu Val Asp Cys Ile Cys 210 215 220

Arg Lys Arg 225

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<212> PRT

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Ser Leu Asn Glu Lys Ala Val Val Ile Thr Asp Phe Thr Asp Glu Asn 20 25 30

Gly Ile Asp Arg Met Lys Glu Gln Ile Gln Glu Lys Tyr Asn Arg Ile 35 40 45

Lys Ala Asp Val Arg Gln Ile Val Ala Asp Glu Leu Gln Arg Ile Gln 50 55 60

Asn Asp Pro Ala Leu Ala His Leu Ile

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<400> 5358

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Val Val Tyr Leu Asp Pro Ser Val Val Ser Met Lys Arg Gly Asp Arg 150 155 Val Arg Val Thr Gly Gly Ile Phe Glu Gly Val Glu Gly Glu Phe Val 170 Arg Ile Lys Gly Asp Arg Arg Val Val Val Ser Ile Gln Gly Val Met 180 185 Ala Val Ala Thr Ala Phe Ile His Pro Ser Leu Ile Glu Leu Ile Lys

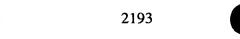
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Asn

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<400> 5359

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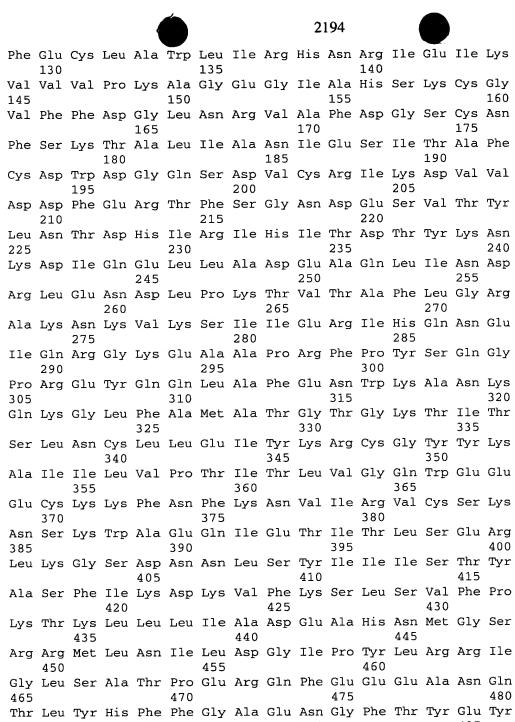


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qaA	Met	Gly	Met	Leu 165	Val	Met	Arg	Ser	Gly 170	Ile	Thr	Ser	Leu	Arg 175	Ser
			180					185					Asp 190		
		195					200					205	Arg		
	210					215					220		Phe		
225					230					235			Thr		240
				245					250				Lys	255	
Arg	Asn	Asn	Ser 260	Leu	Arg	Glu	Leu	Thr 265	Arg	Leu	Ala	Gln	Thr 270	Val	Leu
Tyr	Ser	Leu 275	Leu	Glu	Gln	Tyr	Arg 280	Ile	His	Ile	Pro	G1y 285	Ile	Leu	Leu
Thr	Val 290	His	Lys	Asn	Arg	Phe 295	Gly	Leu	Gln	Ile	Gly 300	Asn	Arg	Ile	Gly
Arg 305	Gly	Gly	Lys	Ser	Lys 310	Ala	Leu	Ala	Asp	His 315	Phe	Ile	Thr	Gly	Leu 320
His	Ile	Gln	Lys	Asn 325	Gln	Ala	Gln	Val	Lys 330	Суѕ	Ser	Arg	Ser	Ser 335	Thr
			340					345					Gln 350		
		355					360					365	Val		
	370					375					380		Val		
Arg 385	Lys	Pro	Asp	Ser	Phe 390	Val	His	Asn	Lys	Leu 395	Phe	Ile	Ile	Ile	Ser 400
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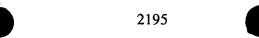
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485 490 Ser Met Gln Glu Ala Ile Asp Lys Gly Val Leu Cys Arg Tyr Tyr Tyr 505 500 Tyr Pro His Val Val Arg Leu Thr Met Ser Glu Met Glu Glu Tyr Met 520 525 Arg Ile Ser Val Gln Leu Ala Lys Phe Phe Asn Asn Asn His Phe Ala 535 Asp Ser Asn Glu Ile Leu Thr Ala Leu Leu Leu Lys Arg Lys Arg Ile 555 Ile His Lys Ala Glu Asn Lys Leu Glu Val Phe Arg Asn Ile Leu Glu 570 565 Gln Arg Phe Gln Glu Lys Gly Asn Leu Lys Tyr Thr Leu Val Tyr Val 585 Pro Glu Gly Leu Lys Pro Asp Thr Ala Asp Ala Asp Val Tyr Asp Asp



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Thr Asp Gln Leu Gln Asp Asp Asp Tyr Ser Glu Lys Leu Ile Asn Glu
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Tyr Thr Ala Val Val Ser Gly Ile Asp Ser Lys Val Thr Val Arg Lys
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Phe Thr Ser Gly Ile Lys Glu Arg Glu Glu Leu Leu Lys Gly Phe Ala
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Asp Gly Asp Ile Glu Val Leu Thr Ser Met Lys Cys Leu Asp Glu Gly
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Val Asp Val Pro Arg Ser Glu Leu Ala Ile Phe Cys Ala Ser Thr Gly
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Asn Pro Arg Gln Phe Ile Gln Arg Arg Gly Arg Ile Leu Arg Lys His
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Pro Asp Lys His Met Ala Val Ile His Asp Leu Val Val Ala Pro Glu
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Thr Glu Leu Arg Arg Val Arg Asn Phe Ser Leu Leu Ser Glu Asn Ser
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Ala Thr Arg Phe Ala Ala Lys Asp Ser Ser Asn Val Glu Gln Cys Thr
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His Ile Thr Ala Phe Ser Val Gly Gly Arg Gly Thr Asn Phe Ser Phe
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Gln Arg Leu Lys Asp Ser Glu Gln Phe Leu Ser Lys
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Trp His Tyr Ser His Ile Met Thr Gly Cys Val Leu Gly Glu Arg Cys
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Thr Ala Thr Val Asp Asp Gly Cys Arg Ile Gly Ala Gly Thr Lys Ile
20 25 30

Trp His Tyr Ser His Ile Met Thr Gly Cys Val Leu Gly Glu Arg Cys
35 40 45

Asn Ile Gly Gln Asn Val Val Ile Ser Pro Asp Val Val Leu Gly Asn
50 55 60

Asn Val Lys Val Gln Asn Asn Val Ser Val Tyr Thr Gly Val Thr Cys
65 70 75 80



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Glu Asp Asp Val Phe Leu Gly Pro Ser Cys Val Phe Thr Asn Val Ile
               85
                                    90
Asn Pro Arg Ser Ala Val Asn Arg Lys Ser Glu Tyr Ala Lys Thr Arg
                                105
Val Gly Lys Gly Ala Thr Ile Gly Ala Asn Ala Thr Ile Val Cys Gly
                            120
His Asp Ile Gly Glu Phe Ala Phe Ile Gly Ala Gly Ala Val Val Thr
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Lys Thr Val Pro Pro Tyr Ala Leu Leu Val Gly Asn Pro Ala Arg Gln
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                                        155
Ile Gly Trp Met Ser Glu His Gly Tyr Arg Leu Glu Phe Asp Glu Arg
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Gly Ile Ala Glu Cys Leu Glu Ser Lys Glu Cys Tyr Gln Leu Arg Asp
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Gly Lys Val Phe Lys Met
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Ser Ile Phe Leu Leu Ile Arg Ile Ile Thr Leu Ile Tyr Pro Ser Ile 35 40 45

Leu Asn Asp Lys Leu Pro Leu Lys Ser Pro Phe His Phe Pro Asn Ile 50 55 60

Ile Leu Ser Trp His Leu Ala Tyr Leu Leu

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Lys Ser Ser Arg Asp Lys Asn Arg Phe Phe Val Asp Tyr Leu Thr Trp 1 5 10 15

Asn Thr Asn Gly Arg Trp Ala Ala Glu Tyr Lys Asp Gly Val Phe Tyr 20 25 30

His Tyr Glu Asn Gly Asp Thr Thr Lys Cys His Thr Asp Ser Ile Leu 35 40 45

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Asp His Phe Val His Ala Pro Asn Gly Asp Tyr Ser Arg Ala His Thr 65 70 75 80

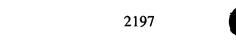
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Glu Leu Leu Thr Leu Ile Asp Gly Leu His Pro Asp Leu Ala Ser Asp 100 105 110

Cys Pro Glu Gly Met Leu Leu Lys Ala Asp Asn Ala Asp Ala Val Tyr 115 120 125

Leu Val Gln Phe Gly Ser Leu His His Ile Pro Asn Pro Asp Val Tyr 130 135 140

Phe Ala Leu Phe Pro Ala Trp Asp Lys Ile Thr Val Lys Ser Gln Glu



Val

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<213> B.fragilis

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 Ala Lys Ser Ala Ile Ile Arg Val Pro Ser Thr Phe Thr Cys Met Ala
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Ser Asp Thr Leu Ser Ser Ile Met Gly Thr Cys Leu 50 55 60

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val Met Tyr Ash Lys Leu val Ash Lys Giu Ala Lys Leu Ala Leu val
20 25 30

Gly Leu Gly Tyr Val Gly Leu Pro Ile Ala Leu Glu Phe Ala Gln Lys 35 40 45 Ile Ser Val Ile Gly Phe Asp Ile Asn Glu Asp Arg Leu Ala Lys Met

50 55 60
Arg Glu Gly Ile Asp Pro Cys Gly Glu Leu Asp Ser Ser Ala Phe Glu
65 70 75 80

Asn Val Asp Ile Glu Phe Thr Ser Ser Ile Glu Lys Leu Lys Glu Ala 85 90 95

Ser Phe Phe Ile Val Ala Val Pro Thr Pro Ile Asp Lys Tyr Asn Lys 100 105 110

Pro Asp Leu Thr Pro Leu Leu Gly Ala Ser Arg Ser Val Ala Lys Ala 115 120 125

Leu Lys Pro Gly Asp Tyr Ile Val Tyr Glu Ser Thr Val Tyr Pro Gly 130 135 140

Cys Thr Glu Glu Asp Cys Leu Pro Val Leu Glu Glu Val Ser Gly Leu 145 150 155 160 Lys Ala Gly Ile Asp Phe Lys Tyr Gly Tyr Ser Pro Glu Arg Ile Asn

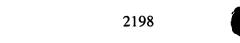
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Gly Cys Asp Pro Glu Ala Leu Asp Thr Val Ala Arg Val Tyr Glu Leu

195 200 205
Val Val Lys Pro Gly Val His Arg Ala Pro Asn Val Lys Val Ala Glu
210 215 220

Ala Ala Lys Ile Ile Glu Asn Thr Gln Arg Asp Val Asn Ile Ala Leu 225 230 235 240

Met Asn Glu Leu Ser Ile Ile Phe Ser Arg Ile Gly Ile Asn Thr Tyr 245 250 255



		2198					
Asp Val Leu Gl		Thr Lys Trp Asn 265	Phe Leu Lys Phe Tyr 270				
275		280	Asp Pro Tyr Tyr Leu 285				
290	295		Gln Ile Ile Ser Ala 300				
305	310	315	Ile Ala Lys Lys Leu 320				
	325	330	Leu Gly Ala Arg Val 335				
34	0	345	Ala Asp Ile Arg Asn 350				
355		360	Asp Phe Gly Cys Asp 365				
370	375		Glu Val His Arg Glu 380				
385	390	395	Asn Tyr Asp Ala Val				
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Ala Asp Asp Ile Arg Ile Leu His Lys Glu Cys Val Ser Leu Ser Asn 25 20

Ala Gly Tyr Glu Val Tyr Leu Val Ala Pro Glu Val Ser Asn Gln Leu

Lys Asn Gly Ile Gln Ile Ile Gly Val Leu Asn Lys Pro Val Ser Arg Phe His Arg Ile Leu Phe Tyr Ile Arg Tyr Val Tyr Lys Lys Ala Leu

75 70 Trp Val Asn Ala Asp Ile Tyr His Leu His Asp Pro Glu Leu Leu Leu

Tyr Ala Leu Leu Leu Lys Lys Lys Gly Lys Ile Val Ile Phe Asp Ser 105 110

His Glu Asp Ile Pro Arg Gln Ile Leu Ser Lys Glu Trp Ile Pro Phe 125 115 120

Phe Ile Arg Lys Phe Ile Ser Phe Ser Tyr Thr Lys Tyr Glu Lys Phe 135 140

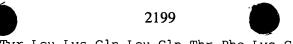
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Ser Arg Leu Val Gln Tyr Asn Lys Arg Thr Tyr Val Val Ser Asn Tyr 170 165

Pro Val Phe Arg Asn Asn Val Glu Arg Ser Ser Val Met Glu Arg Thr 180 185

Ile Gly Phe Ala Gly Asn Ile Lys Gln Glu Tyr Met His Glu Asn Ile 205 200

Leu Ile Ala Leu Thr Asn Leu Gly Asn Val Arg Tyr Leu Leu Ala Gly 210 220



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Asn Ala Glu Glu Gly Tyr Leu Lys Gln Leu Gln Thr Phe Lys Gly Trp
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Asp Phe Val Asp Phe Tyr Gly Arg Ile Ser Lys Glu Lys Val Leu Leu
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                                     250
Leu Tyr Asp Lys Val Ala Ile Gly Met Ala Ile His Asp Tyr Thr Leu
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                                265
                                                     270
Asn Val Gly Gly Lys Lys Gly Gly Leu Gly Phe Ile Lys Asn Phe Glu
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Tyr Met Glu Ala Gly Ile Pro Leu Ile Cys Thr Asp Phe Asp Ile Trp
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Lys Glu Ile Val Glu Glu Tyr Tyr Cys Gly Ile Cys Val Asn Pro His
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                                        315
Asp Val Asn Ser Ile Thr Gly Ala Ile Gln Tyr Leu Ile Asp Asn Pro
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                                    330
Val Ile Ala Arg Lys Met Gly Asp Asn Gly Arg Arg Ala Val Lys Glu
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Lys Phe Asn Trp Glu Thr Gln Glu Glu Ile Leu Leu Gln Leu Tyr Asp
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                            40
Val Val Ile Pro Ile Ile Pro Phe Ser Asn Leu Arg Val Gln Cys
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Tyr Arg Trp Cys Gly Tyr Lys Ile Gly Arg His Thr Phe Ile Gly Met
                                        75
Arg Cys Tyr Leu Asp Asp Met Cys Tyr Asp Leu Ile Glu Ile Gly Glu
                                    90
Asn Val Thr Ile Ser Tyr Gly Val Phe Phe Ala Cys His Gly Arg Lys
                                105
Gln Gly His Asn Arg Ile Ile Ile Lys Asp Gly Ala Tyr Ile Gly Met
                            120
Asn Ser Ser Ile Ile Ser Arg Arg Glu Glu Gly Leu Ile Ile Gly Lys
                        135
                                            140
Glu Ala Ile Val Gly Ala Cys Ser Leu Val Asn Arg Ser Val Pro Asp
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Asn Lys Thr Val Val Gly Val Pro Ala Lys Glu Leu Asn Ala Val Leu
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His Gly Asn Lys
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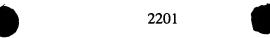
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2200 10 Leu Ala Gly Asn Lys Val Thr Asp Ile Ile Met Lys Leu Gln Met Val 25 Asp Leu His Gly Gln Tyr Leu Asn Ile Lys Pro Glu Val Asp Ala Gly 40 Ile Arg Gln Val Ile Glu Thr Ser Ala Phe Ile Asn Gly Pro Gln Val Lys Glu Phe Ala Glu Asn Leu Lys Ala Tyr Met Gly Ser Lys Tyr Val 70 75 Ile Thr Cys Gly Asn Gly Thr Asp Ala Leu Gln Ile Ala Leu Met Ala Leu Asp Leu Lys Pro Gly Asp Glu Val Ile Val Pro Ala Phe Thr Tyr 105 Val Ala Ser Ala Glu Val Ile Gly Leu Leu Gly Leu Ile Pro Val Met 120 125 Val Asp Val Asp Tyr Ala Thr Phe Asn Val Thr Val Ser Asn Leu Glu 135 140 Lys Ala Leu Ser Pro Lys Thr Lys Ala Ile Ile Pro Val His Leu Phe 150 155 Gly Gln Ser Cys Asp Met Glu Pro Ile Met Gln Phe Ala Lys Gln His 165 170 Gly Ile Tyr Val Ile Glu Asp Asn Ala Gln Ala Ile Gly Ala Val Tyr 185 Thr Phe Ser Asp Gly Ser Lys Lys His Thr Gly Ala Ile Gly His Ile 195 200 Gly Cys Thr Ser Phe Phe Pro Ser Lys Asn Leu Gly Cys Tyr Gly Asp 215 220 Gly Gly Ala Ile Phe Thr Asp Asp Asp Glu Leu Ala Glu Arg Leu Arg 230 235 Met Ile Ala Asn His Gly Gln Gln Val Lys Tyr His His Lys Val Ile 245 250 Gly Cys Asn Ser Arg Leu Asp Thr Leu Gln Ala Ala Ile Leu Asn Val 265 Lys Leu Lys His Leu Asp Glu Tyr Ser His Ala Arg His Glu Ala Ala 275 280 Gln Tyr Tyr Thr Phe Gln Leu Gln Gly Val Lys Gly Ile Ile Thr Pro 295 Glu Glu Leu Pro Leu Ser Thr His Val Tyr His Gln Tyr Thr Leu Lys 310 315 Val Leu Asp Gly Lys Arg Asp Val Leu Lys Gln His Leu Ala Asp Ala 325 330 Gly Ile Pro Ser Met Ile Tyr Tyr Pro Leu Pro Leu Gln Gln Glu Glu 345 Ala Phe Gln Thr Ile Ala Arg Ala Ala Glu Pro Leu Asp Thr Ala Glu 360 365 Lys Leu Ala Tyr Ser Val Leu Ser Leu Pro Ile His Thr Glu Leu Ser 375 380 Thr Glu Gln Gln Asp Leu Val Ile Asn Ser Ile Lys Asp Phe Phe 390 <210> 5370 <211> 373 <212> PRT <213> B.fragilis

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Ala Gly Arg 35	20 Lys Leu	Val I	Leu Lys 40	25 Val	Cys	Gly	Val	Ala 45	30 Val	Leu	Val
Gly Leu Val 50	Val Ala		Ser Ile 55	Pro	Lys	Glu	Tyr 60	Ser	Thr	Ser	Val
Thr Leu Ala 65	Pro Glu	Thr (	Gly Ser	Lys	Ser	Ser 75	Thr	Gly	Gly	Met	Gly 80
Ala Leu Ala	Ala Met 85	Asp (	Gly Ile	. Asn	Leu 90	Gly	Ser	Ser	Thr	Gly 95	Glu
Asp Ala Leu	100 .			105					110		
Phe Leu Leu 115			120	)				125			
Ile Asn Thr 130		-	135				140				
Trp Trp Gly		150				155					160
Val Ser Leu	165	_			170		_	_		175	
Asp Pro Phe	180			185					190		
Ser His Arg			200		-	_		205			
Leu Thr Val		2	215				220				_
Thr Val Met	•	230				235					240
Lys Ala Arg	245				250					255	
Gln Glu Asn	260			265					270		
Gly Asn Gln 275			280					285			-
Leu Gln Asn 290		2	295				300				
Gln Gln Leu 305		310				315					320
Tyr Thr Val	325				330					335	
Asn Lys Ile	340			345					350		
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Pro Ser Ile	_	Ala A	Asp Phe	Ala 25		Leu	Ala	Lys	Asp 30		Glu
Met Ile Asn 35		Glu A	Ala Asp 40		Val	His	Ile	Asp 45		Met	Asp
Gly Val Phe	Val Pro	Asn 1		Phe	Gly	Phe	Pro		Leu	Lys	Tyr

55 60 Val Ala Lys Leu Thr Ser Lys Pro Leu Asp Val His Leu Met Ile Val 70 75 Asn Pro Glu Lys Phe Ile Pro Glu Val Lys Ala Leu Gly Ala His Ile 90 Met Asn Val His Tyr Glu Ala Cys Pro His Leu His Arg Val Val Gln 105 Leu Ile Arg Glu Ala Gly Met Gln Pro Ala Val Thr Ile Asn Pro Ala 115 120 Thr Pro Ile Thr Leu Leu Gln Asp Ile Ile Arg Asp Val Tyr Met Val 135 Leu Val Met Ser Val Asn Pro Gly Phe Gly Gly Gln Lys Phe Ile Glu 150 155 His Ser Val Glu Lys Val Lys Glu Leu Arg Glu Leu Ile Glu Arg Thr 170 Gly Ser Lys Ala Leu Ile Glu Val Asp Gly Gly Val Asn Leu Glu Thr 180 185 Gly Ala Arg Leu Ile Ala Ala Gly Ala Asp Ala Leu Val Ala Gly Asn 200 205 Ala Ile Phe Ala Ala Glu Asn Pro Glu Gly Met Ile His Ala Met Lys 215 Gly Leu 225 <210> 5372 <211> 348 <212> PRT <213> B.fragilis <400> 5372 Ile Phe Tyr Met Asn Lys Lys Arg Lys Lys Ile Phe Leu Ser Ile Leu 10 Ala Thr Phe Phe Phe Ile Cys Ile Ala Gly Ala Gly Thr Val Tyr Tyr 20 25 Tyr Leu Phe Tyr Pro Gln Phe His Pro Ser Lys Thr Thr Tyr Ile Tyr 40 Ile Asp Arg Asp Asp Thr Thr Asp Ser Ile Phe Asn Lys Ile Lys Lys Gln Gly Asn Pro His Ser Phe Asn Gly Phe Lys Trp Met Ser His Phe 75

Arg Glu Tyr Ser Lys Asn Ile His Thr Gly Arg Tyr Ala Ile Lys Pro 85 90 Gly Asp Ser Thr Tyr Gln Leu Tyr Ser Arg Leu Ser Arg Gly Tyr Gln 105 110 Thr Pro Val Asn Leu Thr Ile Gly Ser Val Arg Thr Leu Asp Arg Leu 120 Val Arg Ser Val Gly Lys Gln Leu Met Ile Asp Ser Ala Glu Ile Ala 135 140 Met Ala Leu Tyr Asp Ser Ile Phe Leu Glu Lys Met Gly Tyr Thr Glu 145 150 155 Ala Thr Ile Pro Cys Leu Phe Ile Pro Glu Thr Tyr Gln Val Tyr Trp 170 Asp Val Ser Ala Ala Asp Phe Leu Ala Arg Met Lys Lys Glu His Asp 185 Lys Phe Trp Asn Lys Asp Arg Leu Ser Lys Ala Gln Ala Ile Gly Met 200 Thr Pro Glu Glu Ile Cys Thr Leu Ala Ser Ile Val Glu Glu Glu Thr 215 220 Asn Asn Ala Glu Lys Pro Met Val Ala Gly Leu Tyr Ile Asn Arg

230 235 240 Leu His Ala Gly Met Pro Leu Gln Ala Asp Pro Thr Ile Lys Phe Ala 245 250 Leu Gln Asp Phe Gly Leu Arg Arg Ile Thr Asn Gln His Leu Asp Val 260 265 Gln Ser Pro Tyr Asn Thr Tyr Leu Asn Ala Gly Leu Pro Pro Gly Pro 280 Ile Arg Ile Pro Ser Pro Lys Gly Leu Asp Ser Val Leu Asn Tyr Val 295 300 Lys His Asn Tyr Ile Tyr Met Cys Ala Lys Glu Asp Phe Ser Gly Thr 310 315 His Asn Phe Ala Ser Asn Tyr Ala Asp His Met Val Asn Ala Arg Lys 325 330 Tyr Trp Lys Ala Leu Asn Glu Arg Lys Ile Phe Lys

340

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<213> B.fragilis

275

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265 Phe Phe Ser Ser Leu Pro Asp Ser Leu Glu Asn Glu Ile Glu Ser Arg

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Arg Lys Phe Ala Glu Glu Asn Leu Ser Tyr Pro Phe Leu Ala Lys Lys

390 Phe Ile Glu Glu Cys Ile Asn Asn Arg Val

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                            40
Leu Arg Ala Gln Arg Met Gly Arg Pro Asp Tyr Ala Ile Lys Cys Phe
                        55
Asn Glu Ala Leu Ala Ile Glu Glu Asp Phe Glu Thr Leu Asn Tyr Leu
                    70
                                        75
Ser Gln Leu Tyr Ile Gln Thr Gly Glu Phe Gly Lys Ala His Glu Leu
                                    90
Leu Glu Arg Met Ile Ala Leu Glu Pro Glu Leu Thr Ser Thr Tyr Leu
            100
                                105
Thr Leu Ala Asn Leu Cys Phe Met Gln Glu Asp Tyr Gln Glu Met Ala
                            120
Asp Ala Ala Gln Lys Ala Ile Ala Leu Glu Glu Gly Asn Ala Met Ala
                        135
His Tyr Leu Leu Gly Lys Ala Asn His Gly Leu Asp Asn Gly Ile Met
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Thr Ile Ala His Leu Thr Lys Ala Ile Val Leu Lys Asp Asp Phe Thr
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                                    170
Glu Ala Arg Leu Leu Arg Ala Glu Ala Leu Tyr Lys Met Gln Gln Phe
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Ala Glu Ala Met Glu Asp Ile Glu Ala Ile Leu Thr Gln Asn Pro Asp
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Glu Glu Ala Ala Leu Leu Arg Gly Lys Ile Lys Glu Ala Thr Gly
                        215
                                            220
Lys Glu Glu Glu Ala Glu Thr Asp Tyr Leu His Val Thr Glu Ile Asn
                    230
                                        235
Pro Phe Asn Glu Gln Ala Tyr Leu Tyr Leu Gly Gln Leu Phe Ile Thr
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Gln Lys Lys Leu Thr Ala Ala Ile Glu Leu Phe Asp Glu Ala Ile Glu
                                265
Leu Asn Pro Asn Phe Gly Ala Ala Tyr His Glu Arg Gly Arg Ala Lys
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Leu Leu Asn Gly Asp Lys Asp Gly Ser Ile Glu Asp Met Lys Lys Ser
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                                            300
Leu Glu Leu Asn Pro Lys Glu Gly Glu Asn Leu Asn Gly Gln Phe Asn
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<400> 5377

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4. 15.3 Q.J. 12.3
13
L/I
===
E: 415
D
ĪIJ
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43
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IJ
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70
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Thr Leu Val Asp Lys Phe Ser Asp Ile Arg Lys Phe Glu Asp Tyr Val Ala Val Ala Thr Glu Leu Glu Ala Lys Ser Asp Arg Ala Tyr Ala Lys Glu Cys Gln Ser Asp Lys Lys Ile Ser Gln Arg Val Ser Glu Leu Gln Cys Lys Lys Glu His Leu Gly Gln Gln Ile Asp Glu Ile Lys Cys Asp Ile Arg Lys Gln Glu Asp Val Val Ser Thr Tyr Ser Val Lys Leu Glu Asp Leu Glu Lys His Gln Val Thr Ser Glu Ser Tyr Gln Asp Ile Lys Lys Arg Ile Asp Thr Gln Arg Glu Lys Leu Ala Lys Leu Arg Ser Met Thr Met Val Arg Tyr Asn Thr Asn Leu Leu Asp Glu Phe Trp Ala Leu Met Pro Tyr Gln Asn Val Phe Glu Glu Phe Gln Lys Lys Val Ser Ala Leu Ser Lys Glu Lys Arg Arg Leu Ser Asp Leu Asp Ile Gln Glu Lys Ala Ala Ala Lys Ala Lys Lys Glu Val Val Asp Glu Leu Thr Ser Ser Leu Gln Ser Asp Phe Thr Arg Leu Pro Trp Tyr Leu Pro Asp Gly Glu Thr Met Gln Glu Met Leu Asp Glu Glu Val Cys Lys Val Cys Gly Arg Pro Ala Lys Lys Gly Thr Pro Glu Tyr Arg Phe Met Glu Asn Lys Leu Arg Glu Tyr Leu Glu His Lys Ser Gln Glu Leu Ala Ala Lys Gln Glu Glu Leu Pro Asp Thr Pro Leu Phe Gly Thr Gln Tyr Ile Glu Glu Leu His Ser Leu Ser Ile Ser Phe Gly Gly Met Thr Ala Arg Asp Ile Ser Lys Lys Tyr Arg Glu Val Val Asp Lys Leu Glu Leu Val Ala Arg Ile Lys Arg Asp Ile Ala Glu Lys Glu Ala Glu Leu Leu Glu Leu Glu Asp Glu Lys Ser Arg Leu Leu Ile Gln Ala Asp Gly Leu Thr Glu Ala Met Leu Asp Lys Asn Phe Arg Asp Ile Lys Gly Phe Tyr Glu Gln Arg Asp Arg Ala Lys Asn Arg Ile Ser Asp Tyr Arg Glu Arg Leu Val Lys Val Gln Met Glu Tyr Asp Lys Val Lys Glu Glu Phe Glu Gln Leu Asn Pro Thr Thr Gly Met Ala Lys Val Tyr Asn Arg Val His Thr Leu Leu Asp Lys Val Met Arg Ala Phe Val Asn Ala Lys Ser Glu Asn Leu Arg Arg Phe Leu Ala Ser Leu Glu Glu Arg Thr Asn Ser Tyr Phe Glu Lys Leu Asn Lys Asn Asp Phe Arg Gly Val Ile Arg Ile Val Gln Thr Ala Ser Asp Ser Ala Glu Ile Lys Leu Phe Ser Ser Asn Gly Thr Pro Ile Lys Asn Pro Gly Gly Ala Gln Glu Thr Thr Met Tyr Met Ser Leu Leu Phe Ala Ile Ser Asp Leu Thr Thr Leu Lys Arg Glu Glu Asp Tyr Pro Leu

<210> 5378 <211> 156 <212> PRT <213> B.fragilis

<400> 5378

Phe Cys Pro Ile Ile Thr Lys Val Lys Arg Lys Gln Met Glu Glu Ile Glu Phe His His Ser Leu Pro Ile Gln Leu Arg Phe Asn Asp Val Asp 25 Lys Phe Gly His Val Asn Asn Thr Val Tyr Phe Ser Phe Tyr Asp Leu 40 Gly Lys Thr Glu Tyr Phe Ala Ser Val Cys Pro Gly Val Asp Trp Glu 55 Lys Asp Gly Ile Val Val His Ile Glu Ala Asp Phe Leu Ala Gln 70 Ile Phe Ser Ser Asp His Ile Ala Val Gln Thr Ala Val Cys Glu Ile 85 90 Gly Thr Lys Ser Phe His Leu Leu Gln Arg Val Ile Asp Thr Glu Thr 100 105 Met Glu Val Lys Cys Ile Cys Arg Ser Val Met Val Thr Phe Asp Leu 120

Glu Arg His Glu Ser Lys Pro Leu Thr Glu Glu Trp Ile Glu Ala Ile

135

Cys Arg Phe Glu Gly Arg Asp Leu Arg Lys Lys 145 150 155 <210> 5379 <211> 71

<400> 5379

<213> B.fragilis

<212> PRT

Arg Lys Pro Ile Asn Asn Gln Ile Val Ile Asn Phe Tyr Phe Trp Leu 1 5 10 15

Leu Val Glu Lys Ala Ser Ile Met Gly His Val Leu Leu Arg Leu Pro 20 25 30

Leu Leu Ile Arg Tyr Leu Ala Ser Thr Asp Ile Ser Arg Ser Ile Asn 35 40 45

Asp Tyr Phe Ser Met Leu Cys Val Thr Phe His Asn Phe Lys Lys Leu 50 55 60

Asn Ile Tyr Leu Val Cys Asn 65

<210> 5380

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<211> 174
<212> PRT
<213> B.fragilis
<400> 5380
Arg Val Gly Met (1)
Lys Arg Gly Ile (1)
20
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Arg Val Gly Met Cys Phe Gly Tyr Ser Leu Asn Gly Leu Cys Ser Phe

1 5 10 15

Lys Arg Gly Ile Met Lys Leu Ile Thr Glu Gly Leu Leu Asp Lys Val

20 25 30

Thr Asp Gln Ala Lys Glu Asn Ser Arg Leu Arg Met Asn Tyr Asn Phe 35 40 45

His Asp Ser Met Asp Ala Pro Ile His Arg Met Leu Asn Ala Leu Glu 50 55 60

Pro Gly Thr Tyr Leu Pro Pro His Arg His Lys Asn Pro Asp Lys Glu 65 70 75 80

Glu Val Tyr Leu Val Leu Arg Gly Ser Leu Leu Ala Ile Leu Phe Asp
85 90 95

Asp Glu Gly Asn Val Thr Glu Lys Val His Leu Asn Pro Ala Glu Gly
100 105 110

His Tyr Gly Ile Glu Ile Pro Pro Cys Val Trp His Thr Ile Val Val 115 120 125

Pro Leu Ile Pro Glu Asn Leu Ala Ser Trp Ala Pro Pro Ala Thr Asp 145 150 155 160

Glu Glu Ala Ala Arg Val Phe Met Gln Arg Met Leu Glu Leu 165 170

<210> 5381 <211> 325 <212> PRT

<213> B.fragilis

<400> 5381

Leu Leu Phe Pro Leu Ile Ala Gly Phe Leu Val Gly Asn Gly Leu Phe 20 25 30

Phe Arg Gly Val Cys Val Ser Lys Gly Val Leu Ala Gly Gly Leu Ala 35 40 45

Gly Leu Phe Leu Leu Leu Val Val Tyr Phe Ser His Arg Tyr Ser 50 55 60

Leu Arg Trp Met Phe Gly Cys Ile Leu Tyr Leu Phe Val Phe Phe Gly 65 70 75 80

Gly Ala Gly Gly Ile Asn Gln Ala Leu Gln Gln Thr Leu Tyr Ser Phe 85 90 95

Ser Glu Gln Lys Cys Val Tyr Arg Ala Val Val Leu Glu Gln Pro Glu 100 105 110

Pro Lys Glu His Ser Phe Leu Cys Arg Ala Phe Leu Glu Glu Arg Gln
115 120 125

Asp Ser Val Cys Thr Met Pro Val Asn Arg Lys Val Leu Leu Tyr Ile 130 135 140

Ser Lys Asp Ser Leu Ser Glu Gly Leu Arg Ser Gly Asp Glu Leu Ile 145 150 155 160

Phe Phe Ala His Val Ser Pro Pro Ser Asn Asn Gly Asn Pro Asp Glu 165 170 175

Phe Asp Tyr Ala Arg Tyr Leu Arg Tyr Lys Gly Ile Ser Gly Ile Ala
180
185
190
Phe Val Ala Ser Gly Asn Trp Lys Ile Thr Gly Tyr Arg Phe Ser Arg

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2210 200 Ser Cys Arg Gln Ile Ala Leu Glu Tyr Arg Asp Arg Ile Leu Asp Gln 215 220 Tyr Arg Ala Leu Lys Phe Asn Pro Asp Glu Phe Ala Val Leu Ala Ala 230 235 Leu Thr Val Gly Tyr Lys Glu Glu Leu Ser Glu Asp Ile Arg Glu Thr 245 250 Tyr Ser Val Ser Gly Ala Ser His Val Leu Ala Leu Ser Gly Leu His 265 Ile Gly Phe Leu Tyr Met Met Leu Leu Phe Phe Leu Lys Trp Leu Pro 280 Gly Asn Ala Phe Gly Val Arg Leu Phe Arg Ala Val Val Ile Ile Thr 295 Ala Leu Trp Gly Phe Ala Phe Phe Thr Gly Leu Ser Pro Ser Val Val 315 310 Arg Ser Val Val Phe <210> 5382 <211> 83 <212> PRT <213> B.fragilis <400> 5382 Leu Ile Ile Val Leu Thr Met Ala His Tyr Asn Asn Asn Ser Asn Arg 5 10 Ile Leu Gln Ala Val Leu Ala Asp Glu Lys Leu Ile Glu Phe Gly Glu 25 Tyr Asn Pro Ala Asp Tyr Gln Ser Leu Asp Glu Ala Leu Val Ser Asp 40 Asn Leu Val Val Asn Thr Val Ala Arg Ile Ile Asn Glu Val Asn Glu Glu Ser Ser Ser Arg Glu Ile Tyr Asn Met Val Thr Thr Tyr Leu Lys 75 Asn Asn Ile <210> 5383 <400> 5383 Lys Met Asn Val Asn Ile Thr Ala Val Leu Leu Lys Ser Leu Phe Asp

<211> 204 <212> PRT <213> B.fragilis

His Ile Val Ala Phe Leu Gly Leu Leu Phe Leu Ser Pro Ile Leu Leu 25 Val Thr Ala Ile Leu Ile Arg Val Lys Met Pro Gly Gly Pro Val Ile 40 Phe Lys Gln Lys Arg Val Gly Arg Tyr Gly Arg Leu Phe Thr Met Tyr 55 60 Lys Phe Arg Ser Met Thr Val Gly His Ser Gly Gly Ser Val Ser Val 70 75 Lys Gly Glu Ser Arg Ile Thr Pro Leu Gly Ala Lys Leu Arg Lys Tyr 85 90 Lys Ile Asp Glu Leu Pro Glu Leu Trp Asn Val Leu Ile Gly Asp Met 105 Ser Leu Val Gly Pro Arg Pro Asp Val Pro Gly Tyr Ala Asp Asn Leu 115 120

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Leu Gly Asp Asp Arg Met Leu Leu Leu Lys Pro Gly Ile Thr Gly
                        135
                                            140
Pro Ala Ser Leu Lys Tyr Arg Asn Glu Glu Glu Leu Leu Ala Gly Gln
                    150
                                        155
Asp Asn Pro Gln Lys Tyr Asn Asp Glu Val Leu Phe Pro Asp Lys Val
                                    170
Arg Ile Asn Ile Glu Tyr Leu Asp Asn Trp Ser Phe Trp Asn Asp Ile
                               185
Lys Ile Ile Val Tyr Thr Val Phe Gly Lys Asp Met
                           200
<210> 5384
<211> 308
<212> PRT
<213> B.fragilis
<400> 5384
Glu Pro Ile Val Glu Arg Trp Gln Gly Ala His Tyr Gly Thr Tyr Asn
Asp Gln Gln Asp His Arg Leu Leu Gln Leu Gln Ala Glu Val Ser Leu
Ala Leu Trp Asp Ala Lys Ala Lys Arg Ala Lys Gly Lys Ser Asp Glu
                           40
Ala Arg Arg Leu Asn Gln Glu Leu Asp Asn Val Lys Ala Gln Ile Thr
                        55
Arg His Tyr Gln Tyr Val Cys Asp His Asp Ser Leu Val Thr Ala Lys
                                       75
Ser Val Tyr Asn Arg Tyr Leu Gly Phe Gly Asp Asp Tyr His Thr Leu
               85
                                   90
Met Gly Leu Phe Arg Glu Gln Leu Ala Ser Tyr Lys Glu Lys Ile Gly
                               105
Lys Glu Lys Ala Ala Ser Thr Tyr Arg Gly Leu Val Ala Asp Tyr Lys
                           120
Asn Leu Gln Leu Phe Leu Lys Glu Lys Arg Arg Ile Glu Asp Ile Ala
                       135
Ile Ala Glu Leu Asp Lys Lys Phe Ile Glu Asp Tyr Tyr Asn Trp Met
                   150
                                       155
Leu Gly Thr Cys Ala Leu Ala Ser Ser Thr Ala Phe Gly Arg Gly Asn
                                   170
Thr Leu Lys Trp Leu Met Tyr Thr Ala Gln Glu Arg Gly Trp Ile Arg
           180
                               185
Leu His Pro Phe Ile Gly Phe Asp Cys Leu Ser Glu Tyr Lys Trp Arg
                          200
Ser Phe Leu Thr Glu Glu Asp Leu Gln Ser Val Ile His Val Lys Leu
                       215
                                            220
Asn Tyr Lys Arg Gln Arg Ala Ile Arg Asp Met Phe Leu Phe Met Cys
                   230
                                       235
Phe Thr Gly Leu Ala Tyr Ala Asp Leu Lys Glu Ile Thr Tyr Lys Asn
               245
                                   250
Ile His Thr Asp Ser Glu Gly Gly Thr Trp Leu Ile Gly Asn Arg Ile
                               265
Lys Thr Asp Val Ala Tyr Val Val Lys Leu Pro Ile Thr Ile Glu
                           280
                                                285
Leu Val Glu Arg Tyr Arg Gly Thr Met Lys Arg Lys Val Arg Leu Thr
    290
                       295
Arg Cys Phe Pro
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<211> 82 <212> PRT

<213> B.fragilis

<400> 5385

Asn Ile Leu Leu Ile Lys Arg Asp Ser Lys Asp Leu Leu Asn Lys Ile 1 5 10 15

His Ser Leu Leu Leu Ile Lys Asn Asn Arg Glu Thr Ser Phe His 20 25 30

Leu Ile Asn Pro Lys Leu Ile Asn Lys Leu Thr Ile Phe Val Asp Ile 35 40 45

Thr Lys Ile Ile Asn Leu Tyr Glu Thr Thr Ser Phe Lys Arg Asn Arg 50 55 60

Thr Arg Tyr Gln Lys Arg Ser Ser Gln Lys Glu Asn Tyr Tyr Thr Leu 70 75 80

Tyr Ile

<210> 5386

<211> 190

<212> PRT .

<213> B.fragilis

<400> 5386

Ile Met Gln Leu Leu Lys Lys Arg Ile Leu Gln Asp Gly Lys Cys Tyr

1 10 15

Glu Gly Gly Ile Leu Lys Val Asp Ser Phe Ile Asn His Gln Met Asp 20 25 30

Pro Val Leu Met Lys Ser Ile Gly Val Glu Phe Val Arg Leu Phe Ala 35 40 45

Gly Thr Asn Val Asn Lys Ile Met Thr Ile Glu Ala Ser Gly Ile Ala 50 55 60

Pro Ala Ile Met Thr Gly Tyr Leu Met Asp Leu Pro Val Val Phe Ala 65 70 75 80 Lys Lys Lys Ser Pro Arg Thr Ile Gln Asn Ala Leu Ser Thr Thr Val

His Ser Phe Thr Lys Asp Arg Asp Tyr Glu Val Val Ile Ser Ser Asp
100 105 110

Phe Leu Thr Pro Lys Asp Asn Val Leu Phe Val Asp Asp Phe Leu Ala
115
120
125

Tyr Gly Asn Ala Ala Leu Gly Val Ile Asp Leu Ile Lys Gln Ser Gly
130
140

Ala Asn Leu Val Gly Met Gly Phe Ile Ile Glu Lys Ala Phe Gln Asn 145 150 155 160

Gly Arg Lys Thr Leu Glu Glu Arg Gly Val Arg Val Glu Ser Leu Ala 165 170 175

Ile Ile Glu Asp Leu Ser Asn Cys Arg Ile Thr Ile Lys Asp 180 185 190

<210> 5387

<211> 67

<212> PRT

<213> B.fragilis

20

<400> 5387

Asp Ile Phe Ser Asn Ser Leu Ser Thr Gln Ala Val Phe Gln Gly Glu

1 5 10 15

Asp Glu Ala Gly Phe Ala Ser Ala Val Arg Ala Asp Glu Ala Lys Arg

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1770 (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771) (1771)
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Met Asn Ala Thr Gly Lys Val Ile Asp Asn Phe Ala Asp Gly Leu Ala 40 Ser Ile Gly Ser Asp Asp Ile Val Gly Tyr Leu Ala Lys Val Thr Leu 55 Tyr Val Asp 65 <210> 5388 <211> 123 <212> PRT <213> B.fragilis <400> 5388 Tyr Phe Ala Ser Phe Tyr Phe Phe Arg Asp Lys Ile Tyr Phe Ile Phe Phe Leu Arg Thr Tyr Glu Gly Ile Pro Lys Arg Ala Ile Glu Pro Glu 2.0 25 Phe Ser Ser Phe Arg Asn Ser Tyr Lys Ser Glu Glu His Asn Lys Phe Gln Glu Leu Val Lys Lys Tyr Gly Phe Tyr Pro Glu Leu Cys Asp Thr 55 Cys Arg Lys Gly Asn Leu Leu Lys Ile Lys Ser Lys Arg Arg Phe Tyr Lys Ser Leu Cys Gly Gly Met Thr Arg Asp Leu Leu Ile Lys Pro Phe 85 90 Phe Val Tyr Lys Gly Leu Ser Phe Asn Ser Ile Cys Val Thr Glu Pro 105 Gly Arg Thr Val Arg Pro Ala Asp His Ile Ser 115 120 <210> 5389 <211> 335 <212> PRT <213> B.fragilis <400> 5389 Ile Asn Lys Ser Ile Met Val Lys Ile Ile Leu Gly Val Leu Ser Leu Leu Val Met Leu Ser Cys Ser Thr Ala Val Lys Glu Asn Thr Thr Gln Pro Asp Ile Met Glu Thr Asn Lys Lys Asn Leu Gly Asn Leu Leu Ala 40 Leu Tyr Pro Lys Pro Met Thr Val Val Gly Ala Glu Val Glu Gly Lys Val Asn Trp Leu Val Val Gly His Thr Gly Val Ile Gly His Asp Arg 70 75 Ile Leu Val Ser Met Ser Lys Ser His Tyr Thr Asn Gln Gly Val Lys Lys Ser Lys Arg Leu Ser Val Asn Leu Val Ser Arg Glu Met Leu Pro 105 Lys Ala Asp Tyr Val Gly Ser Val Ser Gly Ala Thr Val Asp Lys Ser 120 Glu Val Phe Ala Tyr His Ile Gly Glu Asn Asp Thr Pro Val Ile Asp 135 Ala Ser Pro Leu Thr Met Glu Cys Glu Val Val Asp Ile Tyr Glu Thr 155 Asp Gly Phe Asp Asn Phe Ile Cys Ala Ile Val Asn Thr Tyr Ala Ala 170 Ser Asp Val Leu Asp Ser Asp Gly Lys Leu Asp Tyr Thr Lys Leu Lys

180 185 190 Pro Val Leu Phe Glu Phe Pro Thr Tyr Ser Tyr Leu Ala Thr Gly Glu 200 205 Ile Ile Gly Lys Cys Leu Asn Pro Asp Lys Pro Gly Met Cys Val Lys 215 Glu Pro Met Thr Thr Asp Gly Ile Val Arg Leu Ser Lys Ile Glu Val 235 Tyr Pro Gln Tyr Leu Asp Glu Tyr Met Asn Tyr Ala Thr Glu Val Gly 245 250 Glu Ile Ser Leu Arg Thr Glu Pro Gly Val Leu Thr Met Tyr Ala Val 265 Gly Glu Lys Glu Asn Pro Cys Lys Val Thr Ile Leu Glu Thr Tyr Ala 280 Ser Arg Glu Ala Tyr Glu Gln His Ile Ala Ser Glu His Phe Gln Lys 295 300 Tyr Lys Gln Gly Thr Leu His Met Val Lys Ser Leu Val Leu Ser Asp 310 315 Gln Thr Pro Leu Asn Pro Ala Asn Lys Leu Asn Asn Phe Met Gln 330

<210> 5390 <211> 415 <212> PRT <213> B.fragilis

<400> 5390 Lys Lys Glu Ser Met Asn Lys Glu Ile Asp Ile Lys Asp Met Ala Pro 10 Val Lys Ala Ser Glu Arg His Val Ile Leu Asp Ala Leu Arg Gly Phe 25 Ala Leu Leu Val Ile Cys Phe Ala Asn Phe Pro Glu Phe Ser Leu Tyr 40 Thr Phe Gln Lys Pro Glu Ile Thr Glu Ala Met Pro Thr Ala Glu Ile 55 Asp Lys Val Ile Arg Phe Pro Gln Tyr Leu Phe Val Asp Gly Lys Phe 75 Tyr Thr Ile Phe Ser Leu Leu Phe Gly Ile Gly Phe Ser Ile Ile Ile 85 90 Ser Asn Ala Ala Lys Lys Gly Thr Asp Gly Phe Arg Ile Phe Tyr Arg 105 Arg Met Ile Val Leu Ala Ala Ile Gly Phe Leu His Leu Met Phe Ile 120 Trp Ser Gly Asp Ile Leu Leu Leu Tyr Ala Leu Leu Gly Met Leu Leu 135 140 Pro Leu Phe Arg His Val Ser Asp Arg Val Leu Leu Gly Thr Ser Ala 150 155 Val Leu Leu Leu Pro Ile Leu Ile Asp Trp Leu Ala Gly Thr Phe 165 170 Gly Val Ser Arg Ser Ser Pro Ala Val Arg Met Gln Gln His Tyr Cys 185 Asn Leu Tyr Gly Ile Thr Glu Tyr Asn Phe Gly Ile Trp Leu Arg Asp 200 205 Ala Glu Asn Tyr Gly Gly Val Phe Gln Phe Leu Val Gln Gly Ala Trp 215 Val Arg Leu Gln Glu Phe Ile Asp Gly Asn Arg Tyr Phe Lys Val Leu 235 Gly Leu Phe Leu Cly Phe Tyr Ile Gly Arg Lys Gln Ile Tyr Ala 250 Asp Leu Glu Ala Asn Arg Val Leu Leu Lys Lys Thr Val Thr Tyr Gly

Phe Leu Leu Gly Leu Pro Leu Ser Val Leu Tyr Ala Trp Ser Ala Val 280 285 Asn Gly His Pro Phe Gly Thr Ala Ala His Thr Ala Ile Tyr Thr Ala 295 Ser Val Tyr Pro Leu Gly Phe Ala Tyr Val Ser Ala Ile Cys Leu Leu 310 315 Tyr Leu His Gly Arg Glu Trp Arg Leu Trp Arg Cys Leu Ala Ala Pro 325 330 Gly Arg Met Ala Leu Thr Asn Tyr Val Gly Gln Ser Val Trp Gly Met 345 Val Leu Phe Tyr Gly Ile Gly Phe Gly Leu Gly Ala Gly Ile Gly Leu 360 Thr Gly Thr Glu Ser Ile Ala Phe Tyr Val Phe Leu Val Gln Met Ala 375 380 Phe Ser Ala Leu Trp Leu Ser Tyr Phe Arg Phe Gly Pro Leu Glu Trp 390 395

Gly Trp Arg Met Leu Thr Tyr Gly Lys Trp Leu Lys Ile Arg Lys 410

<210> 5391 <211> 75

<212> PRT

<213> B.fragilis

260

<400> 5391

Ala Val Cys Pro Leu Leu Glu Val Leu Pro His Asn Leu Ser Val Trp Phe Leu Ser Gly Asn Thr Phe Val Gly Tyr Ala Asp Gln His Pro Leu Val Ser Val Ile Asp Tyr Asp Thr Val Thr Pro Ile Leu His Thr His 40 Ser Gln Phe Ser Val Tyr Ala Leu Tyr Lys Gly Met Gly Val Thr Leu 55 Leu Ser Gly Leu Val Ala Trp Asn Ser Val Gly

70

<210> 5392

<211> 78

<212> PRT

<213> B.fragilis

<400> 5392

Ile Thr Ile Pro Ser Arg Pro Ser Cys Ile Arg Thr Ala Asn Phe Gln 10 Ser Met His Phe Ile Lys Gly Trp Ala Leu Leu Phe Ser Pro Asp Leu 25 Leu His Gly Thr Pro Leu Gly Asn His Ile Lys Asp Phe Ser Phe Phe 40 Ser Tyr Gln Ser Asn Glu Ala Gly Glu His Ile Arg Cys His Ile Ile 55 Asp Met Ala Lys Ser Lys Leu Ile Asn Gly Glu Gln Ile Met

<210> 5393

<211> 208

<212> PRT

<213> B.fragilis

<400> 5393 Ile Leu Lys Pro Thr Arg Asn Met Glu Ile Thr Asn Ala Glu Phe Val Ile Ser Asn Thr Asp Val Lys Lys Cys Pro Ala Gly Thr Phe Pro Glu 25 Tyr Ala Phe Ile Gly Arg Ser Asn Val Gly Lys Ser Ser Leu Ile Asn Met Leu Thr Gly Arg Lys Gly Leu Ala Met Thr Ser Ala Thr Pro Gly Lys Thr Met Leu Ile Asn His Phe Leu Ile Asn Asn Ser Trp Tyr Leu Val Asp Leu Pro Gly Tyr Gly Tyr Ala Arg Arg Gly Gln Lys Gly Gln Glu Gln Ile Arg Thr Ile Ile Glu Asp Tyr Ile Leu Glu Arg Glu Gln 105 Met Thr Asn Leu Phe Val Leu Ile Asp Ser Arg Leu Glu Pro Gln Lys 125 120 Ile Asp Leu Glu Phe Met Glu Trp Leu Gly Glu Asn Gly Ile Pro Phe 135 Ala Ile Ile Phe Thr Lys Ala Asp Lys Leu Lys Gly Gly Arg Leu Lys 150 155 Ile Asn Ile Ser Ala Tyr Leu Arg Glu Leu Arg Lys Gln Trp Glu Glu 170 165 Leu Pro Pro Tyr Phe Ile Thr Ser Ser Glu Glu Arg Leu Gly Arg Thr 185 Glu Val Leu Asn Tyr Ile Lys Ser Ile Asn Lys Glu Leu Asn Ser Lys 200 <210> 5394 <211> 175 <212> PRT <213> B.fragilis <400> 5394 Lys Asn Lys Thr Met Gln Asn Ile Ile Ile Thr Phe Ile Ala Phe Phe 10 Val Leu Arg Leu Leu Ser Leu Ser Tyr Ser Ile Arg Asn Glu Lys Arg Leu Leu Lys Ser Gly Ala Val Gln Tyr Gly Lys Val Asn Ser Leu Leu 40 Leu Thr Leu Ala His Ile Val Tyr Tyr Phe Ser Ala Leu Tyr Glu Ala 55 Tyr Thr Ser Gly Thr Thr Phe Asn Tyr Phe Ser Val Cys Gly Val Phe 75 70 Ile Met Gly Phe Ala Tyr Ala Met Leu Phe Tyr Val Ile Tyr Lys Leu 90 His Asp Val Trp Thr Val Lys Leu Tyr Ile Ile Pro Asp His Arg Ile 105 100 Glu Lys Ser Phe Leu Phe Arg Thr Val Arg His Pro Asn Tyr Tyr Leu 120 Asn Ile Ile Pro Glu Leu Ile Gly Ile Ala Leu Leu Cys Asn Ala Trp 135 Tyr Thr Leu Leu Ile Gly Leu Pro Ile Tyr Ala Cys Leu Leu Ala Ile 150 155 Arg Ile Arg Gln Glu Glu Arg Ala Met Lys Glu Leu Leu Glu Asn

<210> 5395 <211> 495 <212> PRT <213> B.fragilis

<400> 5395 Asn Ser Gly Thr Arg Lys Leu Val Ser Gln Thr Asn Ala Leu Val His 10 Asn Leu Met Gly Thr Gly Lys Gly Lys Thr Asp Tyr Leu Leu Ser Leu Ile Arg Glu Gly Lys Gln Met Thr Leu Gly Gln Gln Leu Arg Leu Thr 40 Ala Tyr Leu Ser Val Pro Ala Ile Met Ala Gln Ile Ser Ser Ile Ala Met Gln Tyr Ile Asp Ala Ser Met Val Gly Ser Leu Gly Ala Asn Ala 75 70 Ala Ser Ile Gly Leu Val Ser Thr Thr Trp Leu Phe Trp Glu 90 85 Leu Cys Ala Ala Ala Ala Thr Gly Phe Ser Val Gln Val Ala His Lys 105 100 Ile Gly Ala Gly Asp Phe Val Gly Ala Arg Lys Ile Leu Arg Gln Ser 120 Ile Ala Ala Thr Leu Val Phe Ser Ser Leu Leu Ala Ala Val Gly Ile 135 Ser Ile Ser Gly Met Leu Pro Gly Trp Leu Gly Gly Asp Glu Val Ile 150 155 Arg Ser Asp Ser Ser Leu Tyr Phe Trp Ile Phe Ala Leu Phe Leu Pro 165 170 Ala Leu Gln Leu Asn Phe Leu Ala Gly Gly Met Leu Arg Cys Ser Gly 185 Asn Met Arg Val Pro Ser Met Leu Asn Val Leu Met Cys Leu Leu Asp 200 Ile Val Phe Asn Phe Phe Leu Ile Phe Pro Ser Arg Gln Val Glu Trp 215 Phe Gly Val Thr Phe Thr Thr Pro Gly Ala Gly Leu Gly Val Glu Gly 230 235 Ala Ile Leu Gly Thr Val Leu Ala Glu Leu Ile Thr Ala Gly Gly Met 250 245 Met Trp Tyr Leu Cys Arg Arg Ser Pro Met Leu Arg Leu Ser Gly Glu 265 Arg Gly Ser Phe Leu Pro Arg Lys Glu Thr Leu Ser Lys Ala Phe Arg 280 285 Ile Ser Leu Pro Met Gly Phe Glu His Met Ala Ile Cys Gly Ala Gln 295 Ile Ala Thr Thr Val Ile Val Ala Pro Leu Gly Ile Ile Ala Ile Ala 310 315 Ala Asn Ser Phe Ala Ile Thr Ala Glu Ser Leu Cys Tyr Met Pro Gly 330 325 Tyr Gly Ile Ser Glu Ala Ala Thr Thr Leu Val Gly Gln Ser Leu Gly 340 345 Ala Asn Arg Ile Arg Leu Leu Arg Arg Phe Ala Asn Ile Thr Val Trp 360 365 Ser Gly Met Leu Ile Met Gly Val Met Gly Thr Leu Met Tyr Met Ala 375 380 Ala Pro Gln Ile Ile Gly Val Met Thr Pro Val Glu Glu Ile Arg Thr 390 395 Leu Gly Ile Glu Ile Leu Arg Ile Glu Ala Phe Ala Glu Pro Met Phe 405 410 Ala Ala Ser Ile Val Ala Tyr Gly Ile Phe Val Gly Val Gly Asn Thr 425

Phe Val Pro Ser Leu Met Asn Phe Gly Ser Ile Trp Gly Val Arg Leu

445 440 Thr Leu Ala Ala Trp Leu Ala Pro Thr Met Gly Leu Arg Gly Val Trp . 455 460 Phe Ala Met Cys Ile Glu Leu Cys Phe Arg Gly Val Ile Phe Leu Ala 470 475 Arg Leu Trp Gly Ser Asn Trp Ile Tyr Lys Leu Arg Ile Asn Arg 490 <210> 5396 <211> 360 <212> PRT <213> B.fragilis <400> 5396 Asn Asn Thr Ala Met Lys Leu Gln Ala Ile Ala Ile Leu Thr Phe Leu Thr Phe Ala Asn Val Met Ala Gln Glu Thr Thr Thr Thr Lys Tyr Ile 25 Asn Ser Thr Asp Met Glu Ala Leu Lys Leu Thr Gln Glu Trp Asp Lys 40 Thr Phe Pro Gln Ser Asp Lys Val Glu His Thr Lys Ile Thr Phe His 55 Asn Arg Tyr Gly Ile Thr Leu Ala Ala Asp Leu Tyr Lys Pro Lys Asn Thr Gln Gly Arg Leu Ala Ala Ile Ala Val Ser Gly Pro Tyr Gly Ala 85 90 Val Lys Glu Gln Val Ser Gly Arg Tyr Ala Gln Thr Leu Ala Glu Arg 105 Gly Phe Leu Thr Ile Ala Phe Asp Pro Ser Tyr Tyr Gly Glu Ser Gly 120 125 Gly Thr Pro Arg Tyr Leu Thr Ser Pro Glu Ile Ser Thr Glu Asp Phe 135 Ser Ala Ala Val Asp Tyr Leu Thr Ser Arg Ala Asp Val Asp Pro Glu 150 155 Arg Ile Gly Ile Leu Gly Ile Cys Gly Trp Gly Gly Phe Ala Leu Asn 165 170 Ala Ala Asn Asp Pro Arg Ile Lys Ala Thr Val Thr Ser Thr Met 185 Tyr Asp Met Ser Arg Val Asn Ala Asn Gly Tyr Phe Asp Ala Met Ser 200 Ser Asp Asp Arg Tyr Lys Leu Arg Glu Gln Leu Asn Ala Gln Arg Thr 215 220 Glu Asp Tyr Arg Asp Asp Ser Tyr Val Arg Asp Gly Gly Val Leu Asp 230 235 Pro Val Thr Asp Asp Thr Pro Gln Phe Val Lys Glu Tyr His Asp Tyr 250 245 Tyr Lys Thr Glu Arg Gly Tyr His Arg Arg Ser Pro Asn Ser Asn Glu 265 Gly Ile Thr Lys Thr Ser Val Leu Ala Phe Ile Asn Met Pro Leu Leu 280 275 285 Thr Tyr Ile Ser Glu Ile Arg Ser Ala Val Leu Met Ile His Gly Glu 295 300 Lys Ala His Ser Arg Tyr Phe Ser Glu Asp Ala Tyr Lys Arg Leu Thr 310 315 Gly Ser Asn Lys Glu Leu Leu Ile Ile Pro Gly Ala Asn His Val Asp 325 330 Leu Tyr Asp Asn Leu Asn Val Ile Pro Phe Asp Lys Ile Asp Ala Phe 345 Phe Lys Asn Ala Leu Lys Glu Lys

115

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<210> 5397
 <211> 213
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 <213> B.fragilis
 <400> 5397
 Leu Asn Arg Tyr Thr Cys Leu Tyr Met Asn Gln Gln Tyr Pro Ser Thr
 Leu Leu Glu Lys Ala Val Gly Glu Phe Ser Lys Leu Pro Gly Ile Gly
                                 25
 Arg Lys Thr Ala Met Arg Leu Val Leu His Leu Leu Arg Gln Asp Thr
                             40
 Ser Val Val Glu Ala Phe Gly Ser Ser Ile Ile Thr Leu Lys His Glu
                         55
Val Lys Tyr Cys Lys Val Cys His Asn Ile Ser Asp Thr Glu Thr Cys
                     70
                                         75
Gln Ile Cys Ala Asn Pro Gln Arg Asp Ala Ser Met Val Cys Val Val
                85
                                     90
Glu Asn Ile Arg Asp Val Met Ala Val Glu Ala Thr Gln Gln Tyr Arg
            100
                                 105
Gly Leu Tyr His Val Leu Gly Gly Val Ile Ser Pro Met Asp Gly Val
                             120
Gly Pro Gly Asp Leu Gln Ile Glu Ser Leu Val Arg Arg Val Ala Glu
                         135
                                             140
Gly Gly Ile Asn Glu Val Ile Leu Ala Leu Ser Thr Thr Met Glu Gly
                     150
                                        155
Asp Thr Thr Asn Phe Tyr Ile Tyr Arg Lys Leu Glu Lys Met Gly Val
                 165
                                     170
Lys Leu Ser Val Leu Ala Arg Gly Val Ser Ile Gly Asp Glu Leu Glu
                                185
Tyr Thr Asp Glu Ile Thr Leu Gly Arg Ser Ile Val Asn Arg Thr Thr
                             200
Phe Thr Gly Thr Val
    210
<210> 5398
<211> 388
<212> PRT
<213> B.fragilis
<400> 5398
Val Met Arg Tyr Asp Phe Asp Thr Ile Val Pro Arg Arg Gly Thr Asn
Ser Tyr Lys Trp Asp Thr Pro Glu Glu Lys Asn Val Leu Pro Met Trp
                                25
Val Ala Asp Met Asp Phe Arg Thr Ala Pro Ala Ile Val Glu Ala Leu
Gln Arg Arg Val Ala His Gly Ile Phe Gly Tyr Thr Lys Val Pro Glu
                                            60
Thr Tyr Tyr Asp Ala Val Val Arg Trp Phe Glu Ser Arg His Arg Trp
                    70
Gln Ile Asp Pro Arg Trp Ile Ile Tyr Thr Ser Gly Val Val Pro Ala
                                    90
Leu Ser Ala Ile Ile Lys Ala Leu Thr Ala Pro Gly Asp Lys Val Ile
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100 105 110 Val Gln Thr Pro Ala Tyr Asn Cys Phe Tyr Ser Ser Ile Arg Asn Asp

120

Gly Cys Glu Leu Ser Ala Asn Asn Leu Ile Tyr Arg Asp Gly Arg Tyr 135 Met Ile Asp Phe Asp Asp Leu Ala Ala Lys Ala Ala Asp Pro Lys Ala 155 150 Lys Ile Leu Leu Cys Asn Pro His Asn Pro Val Gly Arg Val Trp 170 165 Thr Pro Glu Glu Leu Arg His Ile Gly Asp Ile Cys Leu Arg Asn Gly 185 Val Phe Val Val Ala Asp Glu Ile His Cys Glu Leu Thr Tyr Glu Gly 200 His Asp Tyr Thr Pro Phe Ala Ser Leu Ser Glu Arg Phe Gln Gln Asn 215 220 Ser Val Thr Cys Ile Ser Pro Ser Lys Ala Phe Asn Leu Ala Gly Leu 235 230 Gln Ile Ala Asn Ile Ile Ala Leu Asp Glu Glu Val Arg Arg Ile 250 245 Asp Arg Ala Ile Asn Ile Asn Glu Val Cys Asp Val Asn Pro Phe Gly 260 265 Val Ile Ala Thr Ile Ala Ala Tyr Asn Glu Gly Glu Trp Leu Asp 280 Ala Leu Arg Lys Tyr Leu Arg Gly Asn Tyr Glu Tyr Leu Cys His Phe 295 Phe Ala Glu Arg Leu Pro Gln Tyr Pro Val Leu Pro Leu Glu Gly Thr 315 310 Tyr Leu Val Trp Ile Asp Cys Arg Ala Leu Gly Ile Gly Ser Asp Ala 330 325 Thr Thr Leu His Leu Gln Glu Gln Lys Leu Met Val Asn Ser Gly 340 345 Thr Met Tyr Gly Pro Ser Gly Glu Gly Phe Ile Arg Leu Asn Ile Ala 360 Cys Pro Arg Thr Leu Leu Ala Asp Gly Leu Glu Arg Met Ala Arg Val 375 Leu Glu Cys Cys 385 <210> 5399 <211> 204 <212> PRT <213> B.fragilis <400> 5399 Lys Gln Gly Tyr Gln Met Lys Arg Lys Leu Leu Ser Phe Ala Val Leu 10

Ile Thr Leu Leu Leu Val Pro Thr Val Asn Arg Ala Gln Ser Ile Lys 25 Asp Leu Phe Asn Lys Asp Asn Ile Ser Lys Val Val Asn Ala Val Thr 40 Gly His Thr Glu Thr Val Asp Met Thr Gly Thr Trp Arg Tyr Thr Gly 55 60 Ser Ala Ile Glu Phe Glu Ser Glu Asn Leu Leu Lys Lys Ala Gly Gly 70 Thr Val Ala Ala Ser Ala Ala Glu Gln Lys Leu Asp Glu Gln Leu Ala 90 Lys Val Gly Ile Lys Glu Gly Gln Leu Ser Phe Thr Phe Asn Ala Asp 105 Ser Thr Phe Val Ser Thr Leu Gly Lys Arg Lys Leu Asn Gly Thr Tyr 125 120 Ser Tyr Asp Ala Gly Thr Gln Met Leu His Leu Arg Tyr Met Lys Leu 135 130

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2221
Ile Pro Met Asn Ala Lys Val Asn Tyr Thr Thr Gln Gln Met Asp Leu
                    150
                                       155
Leu Phe Glu Ala Asp Lys Leu Leu Lys Leu Ile Thr Phe Leu Ser Ser
                                    170
                165
Lys Ser Ser Ser Ala Thr Leu Lys Ala Ile Ser Ser Leu Ala Asp Ser
                                185
Tyr Asp Gly Met Met Leu Gly Tyr Glu Leu Lys Arg
<210> 5400
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Lys Gln Tyr Gln Lys Phe Val Thr Ile Leu Val Leu Leu Ala Gly Ile
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Val Pro Val Tyr Ala Ile Met Asn Ile Val Phe Asp Pro Asn Asp Asp
                                25
Gly Asn Leu Leu Ile Thr Leu Gly Thr Leu Thr Pro Ile Leu Gly Asp
Leu Leu Met Val Tyr Ala Phe Lys Asp Lys Tyr Gln Ile Leu Ile Ser
Asn His Arg Leu Gln Asn Lys Cys Tyr Leu Cys Ala Arg Tyr Asp Asp
                    70
                                        75
Thr Cys His Tyr Cys Met Leu Leu Cys His Ser Leu Ala Asp Ser Pro
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Tyr His Arg Thr Glu Arg Arg Phe Glu Cys Ser Val Phe
            100
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Pro Lys Arg

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Met Glu Glu Gln Ile Lys Arg Ile Val Lys Ser Gln Lys Val Gln Tyr
Ile Ser Phe Trp Ile Ile Pro Leu Leu Leu Val Leu Leu Gly Glu Ala
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Gly Val Leu Pro Val Gly Ile Lys Ala Asp Asn Val Arg Ala Val Tyr
                            40
Val Phe Glu Thr Val Gly Ile Leu Met Thr Ala Val Cys Ile Pro Leu
                       55
                                            60
Ser Leu Lys Leu Phe Ser Phe Val Leu Thr Lys Lys Ile Asp Gln Leu
                    70
                                        75
Thr Phe Pro Val Ala Leu Ser Arg Tyr Met Leu Trp Gly Ala Val Arg
                                    90
Leu Ala Leu Leu Glu Phe Val Val Phe Asn Leu Ala Gly Tyr Tyr
                                105
Phe Thr Leu Ser Ser Thr Gly Ala Leu Cys Ala Leu Ile Gly Leu Thr
                            120
Ala Ser Phe Phe Cys Leu Pro Gly Glu Lys Arg Leu Arg Ala Glu Leu
                       135
His Ile Asp Lys Glu
145
<210> 5403
<211> 70
<212> PRT
<213> B.fragilis
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His Arg Val Lys Ala Cys Ser Leu Asp Val Asn Lys Lys Phe Phe Lys
                                    10
Cys Lys Arg Leu Val Ile Cys Ala Gln Glu Pro Asp Asn Leu Gln Lys
Ala Leu Thr Met Leu Ile Glu Lys Arg Tyr Lys Asp Glu Asp Thr Gly
                                                45
                            40
Ser Asp Gly Val Asn Ser Leu Pro Lys Leu Lys Leu Ser Tyr Ser Ala
Cys Val Tyr Phe Phe Leu
<210> 5404
<211> 230
<212> PRT
<213> B.fragilis
<400> 5404
Ile Lys Thr Lys Asn Met Arg Pro Tyr Ile Ile Ser His Met Met Thr
                                    10
Ser Val Asp Gly Arg Ile Asp Cys Pro Met Val Gly Gln Leu Ser Thr
                                25
Asp Glu Tyr Tyr Ile Ala Leu Glu Lys Leu Gly Pro Cys Ser Lys Leu
Ser Gly Arg Ile Thr Thr Ala Leu Glu Cys Ser Ala Val Lys Glu Glu
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55 Ser Thr Pro Met Glu Gly Thr Pro Ile Gly His Lys Ser Val Tyr Val 70 75 Ala Ser Lys Ser Asp Glu Tyr Thr Ile Ile Val Asp Thr Tyr Gly Lys Leu Arg Trp Gln Glu Gly Glu Ala Asp Gly His Pro Leu Leu Cys Ile 105 Val Ser Glu Gln Val Ser Glu Glu Tyr Leu Glu Thr Leu Arg Thr Leu 120 Gly Ile Ser Trp Ile Ala Ala Gly Ala Glu Arg Ile Asp Leu Pro Gln 135 Ala Met Glu Leu Leu His Glu His Phe Gly Val Glu Arg Leu Ala Ile 150 155 Val Gly Gly His Ile Cys Gly Gly Phe Leu Glu Ala Gly Leu Ile 165 170 Asp Glu Val Ser Ile Met Val Ala Pro Gly Ile Asp Gly Arg Lys Gly 180 185 Gln Thr Ala Val Phe Asp Gly Ile Ser Arg Met Glu Cys Asn Pro Tyr 200 205 Lys Leu Lys Leu Glu Ser Val Glu Gln Trp Glu Thr Gly Ile Val Trp 215 Leu Arg Tyr Lys Val Lys <210> 5405 <211> 406 <212> PRT <213> B.fragilis <400> 5405 Asn Ile Thr Lys Met Lys Ile Tyr Ile Phe Ile Ile Leu Ala Ala Ala 10 Thr Ser Ile Ser Leu Ile Ser Cys Asp Ser Lys Gln Ser Asp Thr Arg 2.5 Ser Ala Ser Ser Ser Glu Val His Arg Asn Asp Asp Gly His Asp His 40 Arg Glu Ser Asp Gly Asp Asn His Ser Glu Ile Glu Asn Ser Gly Lys 55 Gly His Glu Asp Glu Ile Ile Phe Thr Arg Gln Gln Ala Glu Ala Ile 75 Gly Leu Glu Ile Tyr Asn Val Val Pro Gly Ser Phe Ala Gln Val Ile 90 85 Arg Thr Ser Gly Gln Ile Gln Ala Ala Gln Gly Asp Glu Glu Thr Ile 105 Val Ala Thr Thr Asn Gly Val Val Ser Phe Pro Gly Gln Asn Ile Ile 120 125 Glu Gly Ala Thr Val Gly Val Gly Ser Thr Ile Val Thr Ile Ser Ala 135 140 Lys Asn Leu Tyr Glu Gly Asp Pro Val Ala Lys Ala Lys Ile Ala Tyr 150 155 Glu Thr Ala Leu Lys Glu Tyr Gln Arg Ala Glu Gly Leu Val Lys Asp 165 170 Lys Ile Ile Ser Ala Lys Glu Phe Glu Gln Thr Arg Met Lys Tyr Glu 185 Asn Ala Arg Thr Ala Tyr Glu Ala Gln Ala Ala Asn Val Thr Val Ser 200 205 Gly Val Lys Val Thr Ser Pro Ile Ser Gly Tyr Val Lys Asn Arg Leu 215 Val Ser Gln Gly Glu Tyr Val Thr Val Gly Gln Pro Val Ala Thr Ile

230 235 Ser Lys Asn Arg Arg Leu Gln Leu Arg Ala Asp Val Ser Glu Asn Tyr 250 Phe Asn Glu Leu Lys Lys Ile Arg Gly Ala Asn Phe Met Val Ser Tyr 260 265 Asn Asn Lys Val Tyr Arg Leu Glu Asp Leu His Gly Arg Leu Leu Ser 280 285 Phe Gly Lys Ala Ala Glu Ser Ser Phe Tyr Ile Pro Ile Thr Phe 295 Glu Phe Asp Asn Ile Gly Asp Phe Ile Pro Gly Ser Tyr Val Glu Val 310 315 Tyr Leu Leu Thr Thr Pro Gln Asn Asn Val Phe Ser Ile Pro Val Thr 325 330 Ala Leu Thr Glu Glu Gln Gly Ile Tyr Phe Val Tyr Leu Gln Ile Ala 345 Glu Glu Glu Phe Val Lys Arg Glu Val Gly Ile Gly Glu Ser Asp Gly 355 360 Lys Asn Val Arg Ile Leu Ser Gly Leu Lys Glu Gly Glu Arg Val Val 375 380 Val Lys Gly Ala Tyr Gln Val Lys Leu Ala Ser Ser Ser Ser Val Leu 390 395 Pro Glu Gly His Ser His

<210> 5406 <211> 123 <212> PRT <213> B.fragilis

<400> 5406 Ile Thr Lys Lys Glu Ile Gly Tyr Gly Lys Ile Thr Ile Asn Ser Ile 10 Ser Asn Asp Asn Arg Gln Thr Leu Pro Arg Phe Gln Pro Glu Ala Met Arg Ala Asn Thr Arg Ile Val Asn Ala Leu Gln Ala Phe Gly Arg Thr 40 Arg Ser Met Thr Ser Ala Gln Val Ala Leu Gly Trp Leu Leu Gln Lys Ala Pro Trp Ile Val Pro Ile Pro Gly Thr Thr Lys Leu Ser His Leu

75 Glu Glu Asn Leu Arg Thr Leu Asp Phe Asn Ile Ser Ser Gly Glu Trp Lys Glu Leu Glu Asp Ala Val Ala Ala Ile Pro Val Val Gly Asp Arg 105

Tyr Asn Ala Glu Gln Gln Arg Gln Val Gly Arg 115 120

<210> 5407 <211> 379 <212> PRT <213> B.fragilis

<400> 5407

Lys Ile Met Asp Arg Arg Asn Phe Leu Arg Thr Ala Ser Ser Phe Ala Leu Leu Ala Ala Gly Ala Thr Thr Gly Val Ser Arg Val Phe Thr Glu 25 Pro Pro Ile Ser Ser Leu Ser Gly Asn Leu Ser Asp Lys Asn Thr Pro

Asn Ala Gly Asp Thr Met Glu Tyr Arg Lys Leu Gly Glu Leu Asp Val Ser Ala Ile Gly Leu Gly Cys Leu Pro Met Val Gly Tyr Tyr Gly Gly 75 Lys Tyr Asp Lys Lys Asp Met Ile Ala Leu Ile Arg Arg Ala Tyr Asp 90 Lys Gly Val Thr Phe Phe Asp Thr Ala Glu Val Tyr Gly Pro Tyr Ile 105 Ser Glu Glu Trp Val Gly Glu Ala Leu Ala Pro Phe Arg Asp Lys Val 120 Lys Ile Gly Thr Lys Phe Gly Phe Gly Val Glu Glu Lys Gln Pro Thr 135 Ala Ile Asn Ser Arg Pro Asp His Ile Arg Trp Ala Val Glu Gly Ser 150 155 Leu Lys Arg Leu Arg Thr Asp His Ile Asp Leu Leu Tyr Gln His Arg 165 170 Val Asp Pro Lys Val Pro Met Glu Glu Val Ala Gly Thr Val Lys Asp 185 Leu Met Gln Glu Gly Lys Val Leu His Trp Gly Leu Ser Glu Ala Ser 200 Ala Ser Ser Ile Arg Arg Ala His Ala Val Cys Pro Leu Ser Ala Val 215 Gln Ser Glu Tyr Ala Ile Trp Trp Arg Glu Pro Glu Thr Lys Ile Phe 230 235 Pro Thr Leu Glu Lys Leu Gly Ile Gly Phe Val Pro Tyr Cys Pro Leu 250 Gly Arg Ala Phe Leu Thr Gly Ile Ile Asn Glu Asn Ser Arg Phe Tyr 265 Glu Gly Asp Arg Arg Trp Asn Leu Pro Gln Phe Thr Pro Glu Ala Leu 280 285 Lys His Asn Met Pro Leu Ile Ala Leu Val Arg Lys Trp Ala Glu Arg 295 Lys Gly Val Thr Leu Ala Gln Phe Ala Leu Leu Trp Met Leu Ser Arg 310 315 Lys Ser Trp Ile Ala Pro Ile Pro Gly Thr Thr Asn Pro Ala His Leu 325 330 Asp Asp Leu Leu Gly Ala Gly Thr Val Arg Leu Ser Ala Trp Glu Met 345 Glu Glu Phe Asp Lys Glu Tyr Ala Lys Ile Asp Leu Met Gly His Arg 360 Ala Asp Pro Phe Thr Glu Ser Gln Ile Asp Lys 370

<210> 5408 <211> 225 <212> PRT

<213> B.fragilis

<400> 5408

 Ser Ile Thr
 Leu Thr Lys Gly Cys Trp Ser Ala Tyr Pro Thr Lys Val

 1
 5
 10
 15

 Phe Pro Asp Arg Asn His Thr Asp Arg Leu Trp Gly Arg Thr Ser Asn 20
 25
 30

 Asn Gly Gln Thr Ala Gln Thr Ala Asp Thr Leu Pro Ala Ile Leu Arg 35
 40
 45

 Val Val Leu Asn Asn Gly Ile Glu Met Pro Gln Leu Gly Val Gly Thr 50
 55
 60

 Ser Thr Leu Lys Glu Thr Ala Ala Glu Cys Val Lys His Ala Ile Gly 65
 75

2226

Leu Gly Tyr Arg Leu Val Asp Val Ala Gln Gly Tyr Asp Asn Glu Ala Glu Val Trp Tyr Gly Ile Lys Glu Ser Gly Ile Gly Arg Ser Glu Val 105 Phe Ile Ile Ser Lys Val Ser Pro Asp Ala Val Arg Ser Gly Lys Val 120 Arg Glu Ser Leu Asp Arg Thr Ile Glu Ala Phe Gly Gly Thr Tyr Val 135 140 Asp Leu Met Leu Ile His Trp Pro Val Ala Arg Lys Val Lys Glu Arg 155 150 Trp Arg Ile Met Glu Lys Tyr Val Asp Val Gly Lys Ile Arg Ala Ile 165 170 Gly Val Ser Asn Phe Asn Pro His His Val Asp Glu Leu Leu Ala Tyr 180 185 Ala Arg Ile Lys Pro Val Val Asn Gln Ile Lys Ile His Pro Tyr Met 200 Glu His Gln Glu Val Val Gly Asn Thr Phe Ala Lys Gly Ile Gln Val 215 Gln 225 <210> 5409 <211> 342 <212> PRT <213> B.fragilis <400> 5409 Lys Asn Asn Ser Met Asp Lys Arg Lys Leu Gly Gln Leu Glu Val Ser

Pro Ile Gly Met Gly Cys Met Gly Phe Ser His Gly Tyr Gly Gln Val 25 Pro Pro Glu Ala Tyr Ala Ile Glu Ala Ile Arg Gly Ala Tyr Asp Tyr Gly Cys Thr His Phe Asp Thr Ala Glu Ala Tyr Gly Lys Glu Gln Phe 55 Tyr Ala Gly His Asn Glu Glu Leu Val Gly Lys Ala Ile Glu Pro Phe 75 70 Arg Lys Lys Val Val Leu Ala Thr Lys Phe His Ile Gly Glu Leu Ser 90 85 Lys Pro Asp Glu Thr Asn Leu Tyr Arg Glu Val Arg Arg His Leu Glu 105 Asp Ser Met Ser Arg Leu Arg Thr Asp Tyr Ile Asp Leu Tyr Tyr Leu 120 His Arg Ile Ser Glu Ala Val Arg Leu Glu Asp Val Ala Thr Val Met 140 135 Gly Arg Leu Ile Gln Glu Gly Leu Ile Arg Gly Trp Gly Leu Ser Gln 155 150 Val Ser Ala Asp Gln Ile Arg Ala Ala His Lys Ile Thr Pro Leu Ser 170 Ala Val Gln Asn Ile Tyr Ser Met Val Glu Arg Asp Cys Glu Thr Glu 1.85 180 Ile Phe Pro Val Cys Leu Glu Lys Gly Ile Gly Val Val Pro Phe Ser 205 200 Pro Ile Ala Ser Gly Phe Leu Ser Gly Lys Val Thr Pro Gln Asp Gln 220 215 Phe Gly Phe Asp Asp Val Arg Lys Phe Val Pro Gln Leu Ser Lys Glu 235 230 Asn Ile Glu Ala Asn Gln Pro Ile Leu Asp Leu Leu His Arg Phe Ala 250 245

 Val Glu Lys His Ala Thr Asn Ala Gln Ile Ser Leu Ala Trp Met Leu 260
 265
 270

 His Lys Tyr Pro Asn Val Val Pro Ile Pro Gly Ser Lys Asn Gln Glu 275
 280
 285

 Arg Ile Leu Glu Asn Leu Gly Ala Trp Asn Val Thr Leu Ser Asp Asp 290
 295
 300

 Glu Phe Arg Gln Leu Gln Ser Ala Leu Asp Glu Cys Lys Val His Gly 305
 310
 315

 His Arg Gly Cys Val Glu Thr Glu Gln Thr Ser Phe Gly Lys Gln Trp 325
 330

Ser Glu Glu Thr Asp Lys 340

<210> 5410

<211> 292

<212> PRT

<213> B.fragilis

<400> 5410

Asn Lys Glu Ser Met Lys Val Ile Ser Asn Ala Glu Phe Gly Glu

1 5 10 15

Arg Pro Leu Phe Glu Ser His Asp Leu Arg Leu Glu Asn Val Ile Ile 20 25 30

Arg Ala Gly Glu Ser Ala Ile Lys Glu Cys Ser Asn Ile Glu Ala Val35 40 45

Asp Cys Arg Phe Glu Gly Asn Tyr Pro Phe Trp His Val His Gly Phe 50 55 60

Val Ile Asp Arg Cys Phe Phe Asp Val Gly Gly Arg Ser Ala Leu Trp 65 70 75 80

Tyr Ser Asp Asn Leu Lys Met Thr Asn Thr Arg Ile Asp Ala Pro Lys 85 90 95

Met Phe Arg Glu Met His Asp Ile Glu Ile Glu Asn Val Glu Ile Asn 100 105 110

Asp Ala Asp Glu Val Phe Trp Arg Cys Lys Asn Leu Asp Ile Lys Asn 115 120 125

Leu Lys Leu His Gly Gly Thr Tyr Pro Phe Met Phe Ser Ser Asn Ile 130 135 140

Arg Ile Asp Gly Leu Glu Ser Asp Ser Lys Tyr Val Phe Gln Tyr Val
145 150 155 160

Lys Asn Val Glu Leu Arg Asn Ala Lys Ile Thr Thr Lys Asp Ala Phe 165 170 175

Trp Glu Val Glu Asn Val Thr Ile Tyr Asp Ser Glu Leu Asn Gly Glu 180 185 190

Tyr Leu Gly Trp His Ser His Asn Leu Arg Leu Val Asn Cys His Ile 195 200 205

Thr Gly Glu Gln Pro Leu Cys Tyr Ala His Asp Leu Val Leu Glu Asn 210 215 220

Cys Thr Phe Gly Pro Asp Cys Asp Arg Ala Phe Glu Tyr Ser Ser Val 225 230 235 240

Gln Ala Thr Ile Lys Gly Ala Ile Gly Gly Val Lys Asn Pro Arg Thr 245 250 255

Gly Cys Ile Thr Ala Glu Ser Tyr Gly Glu Ile Ile Leu Asp Glu Asn 260 265 270

Ile Lys Ala Pro Ala Asp Cys Lys Leu Lys Leu Trp Asp Glu Lys Thr 275 280 285

Cys Phe Thr Asp

290

<211> 287 <212> PRT

<213> B.fragilis

<400> 5411

Arg Tyr Tyr Gly Met Asp Phe Lys Glu Leu Asn Asn Gly Val Lys Met 1 5 10 15

Pro Ile Gln Gly Phe Gly Val Phe Gln Ile Pro Asp Ala Thr Glu Cys 20 25 30

Glu Arg Val Val Thr Asp Ala Leu Ala Val Gly Tyr Arg Leu Ile Asp  $35 \hspace{1cm} 40 \hspace{1cm} 45$ 

Thr Ala Ser Val Tyr Gly Asn Glu Arg Ala Val Gly Met Ala Ile Arg 50 55 60

Lys Ser Gly Ile Pro Arg Glu Glu Leu Phe Ile Thr Thr Lys Ala Trp 65 70 75 80

Ile Ser Glu Met Gly Tyr Glu Arg Thr Leu Arg Ala Leu Asp Thr Ser 85 90 95

Leu Ala Arg Leu Gly Leu Asp Tyr Leu Asp Leu Tyr Leu Ile His Met 100 105 110

Pro Phe Gly Asp Tyr Tyr Gly Ala Trp Arg Ala Met Glu Lys Leu Tyr 115 120 125

Ala Lys Gly Arg Val Arg Ala Ile Gly Val Cys Asn Phe Glu Pro Asp 130 135 140

Gln Ile Glu Val His Pro Tyr Thr Pro Gln Thr Asp Ala Ile Arg Thr 165 170 175

Met Gl<br/>n Glu Leu Gly Ile Gl<br/>n Ala Glu Ala Tr<br/>p Gly Pro Leu Ala Glu 180  $\phantom{0}$  185  $\phantom{0}$  190

Gly Arg Asn Gly Leu Phe Thr Asp Asp Ile Leu Thr Gly Ile Ala Arg 195 200 205

Lys Tyr Asp Lys Ser Ala Ala Gln Val Val Leu Arg Trp His Leu Gln 210 215 220

Arg Gly Val Val Ala Ile Pro Lys Ser Val His Arg Gln Arg Met Gln 225 230 235 240 Glu Asn Phe Asn Ile Gly Asp Phe Met Leu Thr Pro Glu Asp Met Ala

 $245 \hspace{1cm} 250 \hspace{1cm} 255 \\ \text{Ala Ile Ala Ser Met Asn Met Gly Tyr Asp Met Ile Leu Asp Leu His}$ 

260 265 270
Ala Pro Glu Glu Val Gln Arg Leu Tyr Gly Ile Glu Cys Pro Ala
275 280 285

<210> 5412

<211> 227

<212> PRT

<213> B.fragilis

<400> 5412

Leu Glu Ile Met Ile Lys Ala Ile Gly Leu Thr Lys Ile Phe Arg Thr
1 5 10 15

Glu Ser Val Gln Thr Ile Ala Leu Asn Glu Ile Ser Ile Asn Ile Ser 20 25 30

Glu Gly Glu Phe Val Ala Ile Met Gly Pro Ser Gly Cys Gly Lys Ser

Thr Leu Leu Asn Ile Leu Gly Leu Leu Asp Asn Pro Thr Ser Gly Glu 50 55 60

Leu Trp Phe Ile Gly Lys Glu Val Ser Arg Tyr Ser Glu Asn Asp Arg 65 70 75 80

Thr Asp Met Arg Asn Gly Asn Ile Gly Phe Val Phe Gln Ser Phe Asn

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85 90 Leu Ile Asp Glu Leu Thr Val Phe Glu Asn Val Glu Leu Pro Leu Leu 105 Tyr Ala Gly Val Pro Val Arg Glu Arg Val Asp Arg Val Asn Lys Ala 120 125 Leu Glu Arg Met Gln Ile Ser His Arg Thr Glu His Tyr Pro Gln Gln 135 Leu Ser Gly Gly Gln Gln Gln Arg Val Ala Ile Ala Arg Ala Ile Val 150 155 Thr Asn Pro Lys Ile Ile Leu Ala Asp Glu Pro Thr Gly Asn Leu Asp 170 Ser Thr Asn Gly Asn Glu Val Met Leu Leu Leu Lys Glu Leu Asn Lys 185 180 Asp Gly Ala Thr Val Val Met Val Thr His Ser Glu Glu Asn Ala Gln 200 Glu Ala Gly Arg Ile Val Arg Met Met Asp Gly Cys Ile Leu Thr Glu 215 Asn Arg Arg 225 <210> 5413 <211> 455 <212> PRT <213> B.fragilis <400> 5413 Val Asp Tyr Ile Tyr Leu Cys Asp Thr Ile Tyr Lys Ala Thr Lys Arg Asn Met Lys Asp Thr Pro Ile Lys Arg His Leu Ile Asp Glu Thr Ile 25 Glu Glu Phe Gln Ile Thr Asp Phe Ser Lys Ala Thr Ile Arg Glu Val 40 Lys Ala Ile Ala Ala Lys Ala Glu Thr Ala Ser Gly Val Glu Phe Ile 55 60 Lys Met Glu Met Gly Val Pro Gly Leu Pro Pro Ser Thr Val Gly Val 70 75 Lys Ala Glu Ile Glu Ala Leu Gln Asn Gly Ile Ala Ser Leu Tyr Pro 90 85 Asp Ile Asn Gly Leu Pro Glu Leu Lys Ser Glu Ala Ser Lys Phe Ile 105 Lys Ala Phe Ile Asp Ile Asp Leu Lys Pro Glu Gly Cys Val Pro Val 120 125 Thr Gly Ser Met Gln Gly Thr Phe Ala Ser Phe Leu Thr Cys Ser Gln 135 140 Cys Asp Glu Lys Lys Asp Thr Ile Leu Phe Ile Asp Pro Gly Phe Pro 150 155 Val Gln Lys Gln Gln Leu Val Val Met Gly Gln Lys Tyr Glu Thr Phe 165 170 Asp Val Tyr Asp Tyr Arg Gly Asp Lys Leu Lys Glu Lys Leu Glu Ser 185 Tyr Leu Lys Lys Gly Asn Ile Ser Ala Val Ile Tyr Ser Asn Pro Asn 200 205 Asn Pro Ser Trp Ile Cys Leu Lys Asp Glu Glu Leu Lys Ile Ile Gly 215 Glu Leu Ala Thr Gln Tyr Asp Val Ile Val Leu Glu Asp Leu Ala Tyr 230 235 Phe Ala Met Asp Phe Arg Gln Asp Leu Ser Thr Pro Tyr His Ala Pro

250

Tyr Gln Pro Ser Val Ala His Tyr Thr Asp Asn Tyr Ile Leu Leu Ile

260 265 270 Ser Gly Ser Lys Ala Phe Ser Tyr Ala Gly Gln Arg Ile Gly Val Ser 280 Cys Ile Ser Asp Lys Leu Tyr His Arg His Tyr Pro Gly Phe Asp Lys 295 300 Arg Tyr Gly Gly Gly Thr Phe Gly Thr Val Phe Ile His Arg Val Leu 315 Tyr Ala Leu Ser Ser Gly Thr Ser His Ser Ala Gln Phe Ala Met Ala 325 330 Ala Met Leu Lys Ala Ala Asn Glu Gly Lys Tyr Asn Phe Leu Asn Glu 340 345 Val Arg Ile Tyr Gly Glu Arg Ala Arg Lys Leu Lys Glu Ile Phe Leu 360 365 Arg Tyr Gly Phe His Leu Val Tyr Asp Lys Asp Leu Glu Asp Pro Val 375 Ala Asp Gly Phe Tyr Phe Thr Ile Gly Tyr Pro Gly Met Thr Ser Gly 390 395 Glu Leu Ala Lys Glu Leu Met Tyr Tyr Gly Val Ser Ala Ile Ser Leu 405 410 Val Thr Thr Gly Ser Gln Gln Gln Gly Leu Arg Ala Cys Thr Ser Phe 420 425 Ile Lys Glu His Gln Tyr Ala Gln Leu Asp Glu Arg Met Lys Leu Phe 440 Ala Glu Asn His Pro Ile Ser 450 <210> 5414 <211> 498 <212> PRT <213> B.fragilis <400> 5414 Leu Ala Ile Ile Val Cys Lys Ile Ser Val Thr Phe Ala Leu Val Met 10 Met Ile Leu Ala Thr Ile Val Cys Tyr Phe Ala Ile Leu Leu Ile 25 Ala Arg Ile Thr Gly Arg Lys Gly Gly Ser Asn Ala Ala Phe Phe Lys Gly Glu Asn Gln Ser Pro Trp Tyr Val Val Ala Phe Gly Met Ile Gly 55 Ala Ser Ile Ser Gly Val Thr Phe Val Ser Val Pro Gly Met Val Lys 70 75 Ala Met Asp Met Thr Tyr Met Gln Thr Val Phe Gly Phe Phe Gly 85 Tyr Leu Ala Val Ala His Ile Leu Leu Pro Leu Tyr Tyr Lys Leu Asn 105 110 Leu Thr Ser Ile Tyr Thr Tyr Leu Asp Thr Arg Ile Gly Lys Arg Ala 120 Tyr Arg Thr Gly Ala Ser Phe Phe Leu Leu Ser Arg Met Leu Gly Thr 135 140 Ala Ala Lys Leu Tyr Leu Val Cys Leu Ile Leu Tyr Thr Tyr Val Phe 150 155 Arg Asp Met Gly Ile Pro Phe Trp Ser Ile Ala Ala Gly Ser Val Ala 165 170 Leu Val Trp Ile Tyr Thr His Lys Ser Gly Ile Lys Thr Ile Val Trp 185 Thr Asp Thr Leu Gln Thr Phe Cys Leu Ile Ala Ala Leu Ile Ser Ile 200 Leu Val Phe Val Thr Ala Lys Leu Asn Leu Asp Phe Ser Gly Val Ile

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215 220 Gln Thr Ile Ser Ser Asn Glu His Ser Arg Ile Phe Val Phe Asp Asp 230 235 Trp Met Ser Arg Gln Asn Phe Phe Lys Gln Phe Leu Ser Gly Ile Phe 245 250 Ile Val Ile Val Met Thr Gly Leu Asp Gln Asp Met Met Gln Lys Asn 265 Leu Ser Cys Arg Ser Leu Arg Asp Ala Gln Lys Asn Met Tyr Cys Tyr 280 Gly Phe Ala Phe Ala Pro Leu Asn Leu Leu Phe Leu Gly Leu Gly Ile 295 Leu Leu Val Leu Ala Gln Glu Met Gln Leu Glu Leu Pro Ala Ala 310 315 Gly Asp Asp Ile Leu Pro Leu Phe Ala Thr Gln Gly Tyr Leu Gly Glu 330 Gly Val Leu Ile Leu Phe Thr Ile Gly Ile Ile Ala Ala Ala Phe Ser 340 345 Asn Ser Asp Ser Ala Leu Thr Ala Met Thr Thr Ser Phe Cys Ile Asp 360 Leu Leu Asp Thr Gly Lys Asp Thr Glu Glu Glu Ala Arg Arg Lys Arg 375 380 Asn Arg Val His Ile Gly Leu Ser Val Leu Leu Ile Phe Phe Ile Cys 390 395 Leu Val Asp Ala Leu Asn Asn Gln Ser Val Ile Asp Ala Ile Tyr Ile 405 410 Ile Ala Ser Tyr Thr Tyr Gly Pro Leu Leu Gly Met Phe Ala Phe Gly 425 Leu Phe Thr Gln Arg Lys Thr Asn Asp Arg Trp Val Pro Phe Ile Ala 440 445 Ile Ala Ser Pro Leu Ile Cys Tyr Ala Ala Asp Arg Phe Ala Arg Gln 455 460 Glu Thr Gly Tyr Gln Phe Gly Tyr Glu Leu Leu Met Leu Asn Gly Ile 470 475 Leu Thr Phe Ala Gly Ile Trp Ile Val Ser Lys Lys Gln Leu Lys Asn 485 490 Glu Phe <210> 5415 <211> 141 <212> PRT <213> B.fragilis <400> 5415 Tyr Pro Thr Ile Gly Arg Gln Pro Arg Pro Ile Ala Asp Thr Ser Ser 10 Ser Pro Ser Leu Arg Tyr Ser Ile Val Ser Pro Ala Phe Gly Val Phe 25 Leu Ser Asp Lys Phe Pro Asp Lys Glu Glu Ile Gly Gly Ser Val Asn 40 Thr Arg Glu Thr Pro Val Val Ala Pro Ala Ala Ser Ser Ala Lys Leu Asp Ala Val Leu Lys Lys Phe Leu Arg Ser Ile Ile Phe Tyr Phe Phe 70 Ile Val His Phe Met Ile Ala Asn Leu Pro Arg Leu Asn Lys Ser Ala

Cys Ile Arg Phe Thr Asp Ile Tyr Thr Arg Ile Leu Glu Ile Val His 100 105 110 Glu Leu Arg Phe Pro Ser Ile Gln Tyr Phe Ser Phe Leu Phe Lys Lys

120 Ile Met Gly Leu Ala Pro Asn Glu Tyr Arg Leu Ile Asn 130 135 <210> 5416 <211> 164 <212> PRT <213> B.fragilis <400> 5416 His Cys Asn Met Phe Ala Thr Trp Leu Gln Glu Ile Tyr Ser Ile Phe 10 Val Pro Lys Val Lys Thr Lys Gln Met Lys Arg Ile Phe Phe Val Tyr 25 Pro Leu Ala Ile Ala Thr Leu Phe Leu Ile Val Leu Ser Ala Ile Pro 40 His His His Lys Glu Met Cys Thr Val Met Glu Leu Cys Glu 55 Gln Asp Asp Ile Tyr Asn Asp Gly His Thr Asp His Glu Ala Gly Gln 70 75 Asp Ala His Asn Glu Asn Thr Cys Val Ser Gln Ala Gly Tyr Ile Phe 85 90 Pro Ser Ser Val Asp Lys Ser Asn Leu His Asp Gly Ser Leu Met Asn 100 105 Ile His Leu Pro Val Leu Tyr Leu Phe Ala Asp Ile Leu Thr Ile His 115 120 125 Phe Asp Ile Pro Ile Ser Glu Asn Thr Tyr Asp Arg Tyr Val Val Ser 135 Tyr Thr Ser Val Val Leu Gly Glu Ser Ser Gly Leu Arg Ala Pro Pro 150 155 Tyr Phe Phe Ser <210> 5417 <211> 199 <212> PRT <213> B.fragilis <400> 5417 Ile Arg Gly Met Asn Ile Asn Thr Asp Ile Phe Lys Ile Gln Ser Asn Asn Val Met Pro Ser Arg Gly Lys Ile Leu Ile Ser Glu Pro Phe Leu 25 His Asp Val Thr Phe Gly Arg Ser Val Val Leu Leu Val Asp His Thr 40 Glu Glu Gly Ser Met Gly Leu Ile Ile Asn Lys Pro Leu Pro Leu Met 55 Leu Asn Asp Ile Ile Lys Glu Phe Lys Tyr Ile Glu Asp Ile Pro Leu 75 His Lys Gly Gly Pro Ile Gly Thr Asp Thr Leu Phe Tyr Leu His Thr 85 90 Leu His Glu Ile Pro Gly Thr Leu Pro Ile Asn Asn Gly Leu Tyr Leu 105 Asn Gly Asp Phe Asp Ala Ile Lys Lys Tyr Ile Leu Gln Gly Asn Pro 120 Ile Lys Gly Lys Ile Arg Phe Phe Leu Gly Tyr Ser Gly Trp Glu Cys 135 Glu Gln Leu Ile Gln Glu Ile Lys Glu Asn Thr Trp Ile Ile Ser Lys 145 150 155

2233

Glu Glu Asn Thr Tyr Leu Met Asn Glu Asp Ile Lys Gly Met Trp Lys
165 170 175

Glu Ala Leu Gly Lys Leu Gly Ser Lys Tyr Glu Thr Trp Ser Arg Phe 180 185 190

Pro Gln Val Pro Ser Leu Asn 195

<210> 5418

<211> 75 <212> PRT

<213> B.fragilis

<400> 5418

Cys Thr Gly Asn Lys Asn Ser Ala Thr Val Gly Ser Phe Gln Pro Arg 1  $\phantom{000}5\phantom{000}$  10  $\phantom{000}15\phantom{000}$ 

Gly Glu Asp Tyr Leu Phe Met Tyr His Trp Leu Asp Glu Phe Ala Tyr 20 25 30

Arg Thr Thr Met Ser Trp Trp Leu Phe Leu Gly Gly Leu Ile Ile 35 40 45

Ala Gly Ile Thr Leu Leu Thr Val Ile Gly Gln Thr Trp Arg Thr Ala 50 55 60

Ser Gln Asn Pro Val Arg Ser Leu Arg Tyr Glu 65 70 75

<210> 5419

<211> 82

<212> PRT

<213> B.fragilis

<400> 5419

Asn Pro Cys Phe Gly Arg Asp Glu Gln Phe Leu Thr Arg Asn Thr Thr 1 5 10 15

Phe Pro Asn Ser His Thr Asp Arg Pro Phe Ile Ser Ile Asp Arg Ser 20 25 30

Gly Val Asp Glu Pro Ile Ala Asp Gly Lys Arg Ile Gly Asn Asn Ser 35 40 45

Phe Ala Leu Gly Gly Ile Gly Tyr Leu Lys Asp Thr Lys Ala Leu Tyr 50 55 60

Arg His Leu Tyr Ser Val Ile Gln Phe Phe Glu Ile His Thr Ile Ile 65 70 75 80

Ser Leu

<210> 5420

<211> 140

<212> PRT

<213> B.fragilis

<400> 5420

Lys Thr Lys Phe Met Asp Leu Lys Lys Thr Thr Phe Tyr Leu Phe Thr 1 5 10 15

Leu Phe Ser Leu Met Leu Ile Ser Cys Ser Asn Asp Asp Glu Asn Lys
20 25 30

Asn Asp Ala Gln Val Thr Val Thr Val Val Ser Ala Asp Gly Lys Pro 35 40 45

Leu Pro Asn Glu Ile Val Gln Met Phe Asp Glu Lys Thr Tyr Glu Glu 50 55 60

Phe Lys Lys Asp Asn Arg Thr Thr Pro Thr Ala Tyr Ala Leu Thr Asn 65 70 75 80



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Ser Thr Gly Val Ala Thr Phe Ile Phe Thr Tyr Asp Lys Trp Phe Glu 85 90 95
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Ser Asn Lys Asp Arg Phe Phe Thr Phe Ala Val Gln Tyr Gly Ser Gly
100 105 110

Thr Glu Asn Tyr Glu Ile Trp Ser Ala Gly Arg Thr Val Arg Pro Gly
115 120 125

Ser Val Thr Gln Ile Glu Leu Lys Leu Lys Pro Leu 130 135 140

<210> 5421

<211> 61

<212> PRT

<213> B.fragilis

<400> 5421

Thr Ser Ser Ser Asp Ile Leu Phe Leu Asn Phe Ile Arg Ser Thr Cys
1 5 10 15

Val Phe Phe Ile Ser Phe Val Ile Val Met Val Met Ile Ala Ile
20 25 . 30

Phe Gly Asn Lys Lys Gln Lys Ser Lys Lys Ile Asp Val Tyr Phe Leu 35 40 45

Ala Phe Leu His Gly Asp Asp Ser Cys His Gly Ile Pro 50 60

<210> 5422

<211> 127

<212> PRT

<213> B.fragilis

<400> 5422

Val Lys Glu Ser Val Arg Ile Phe Arg Phe Ala Val Ile Gly Thr Leu 1 5 10 15

Asn Ala Leu Ile Thr Ala Phe Val Ile Trp Leu Met Met Asp Glu Leu 20 25 30

Ser Tyr Asp Tyr Ile Pro Ala Asn Ile Thr Ala Tyr Ile Val Ala Gln 35 40 45

Ile His Asn Phe Ile Trp Ser Lys Tyr Trp Ile Phe Pro Ile Glu Asn 50 55 60

Lys Lys Asn Asn Ile Trp Lys Gln Met Leu Phe Phe Cys Ser Ala Phe 65 70 75 80

Gly Leu Ala Tyr Ser Ala Gln Phe Leu Phe Leu Val Thr Leu Val Glu 85 90 95

Cys Gly Asp Val Asn Glu Tyr Leu Ala Gln Phe Leu Gly Leu Phe Ile 100 105 110

Tyr Gly Thr Val Asn Phe Ile Val Asn Lys Lys Leu Thr Phe Arg
115 120 125

<210> 5423

<211> 1058

<212> PRT

<213> B.fragilis

<400> 5423

Lys Ser Ser Pro Tyr Gln Ser Ile Thr Ser His Gln Pro Leu Ile Val

Asn Cys Met Phe Ser Lys Phe Phe Ile Asn Arg Pro Ile Phe Ala Thr

Val Leu Ala Leu Ile Ile Val Val Ala Gly Leu Val Thr Leu Asn Ile 35 40 45



265 Arg Thr Glu Glu Gly Gly Lys Met Leu Arg Leu Lys Asp Val Ala Arg 280 Ile Asp Leu Gly Ser Ser Ser Tyr Asn Val Val Ser Lys Leu Lys Gly 295 His Pro Thr Ala Ala Ile Ala Ile Tyr Gln Gln Pro Gly Ser Asn Ser 310 315 Leu Asp Val Ser Lys Gly Val Lys Ala Lys Met Gln Glu Leu Ala Gln 325 330 Asn Phe Pro Ala Gly Val Ser Tyr Asn Val Thr Leu Asp Thr Thr Asp 345 Val Ile Asn Ala Ser Ile Asp Glu Val Leu Val Thr Phe Leu Glu Thr 360 Thr Leu Leu Val Val Leu Val Ile Phe Leu Phe Leu Gln Asn Trp Arg 375 380 Ala Val Ile Ile Pro Cys Ile Thr Ile Pro Val Ser Leu Ile Gly Thr 390 395 Leu Ala Val Met Ala Ala Leu Gly Phe Ser Ile Asn Thr Leu Thr Leu 405 410 Phe Gly Leu Ile Leu Ala Val Ala Ile Val Val Asp Asp Ala Ile Val 420 425 Val Val Glu Asn Ala Ser Arg Leu Leu Glu Thr Gly Gln Tyr Ser Pro 440 445 Lys Glu Ala Val Thr Lys Ala Met Gly Glu Ile Thr Gly Pro Ile Val 455 460 Gly Val Val Leu Val Leu Leu Ala Val Phe Ile Pro Thr Thr Leu Ile 470 475 Ser Gly Ile Ser Gly Gln Leu Tyr Lys Gln Phe Ala Leu Thr Ile Ala 490 Ala Ser Thr Val Leu Ser Gly Ile Asn Ser Leu Thr Leu Thr Pro Ala 505 Leu Cys Ala Leu Phe Leu Glu His Asn Lys Pro Ser Asn Phe Phe Ile

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Tyr Lys Gly Phe Asn Lys Val Tyr Asp Lys Thr Gln Asn Leu Tyr Asp Arg Ile Val Lys Gly Leu Leu Val Arg Pro Gly Leu Ala Leu Ile Ser Tyr Gly Ile Ile Thr Ala Val Ala Val Ile Leu Phe Met Lys Trp Pro Ser Thr Phe Val Pro Asp Glu Asp Asp Gly Tyr Phe Ile Ala Val Ile Gln Leu Pro Pro Ala Ser Ser Leu Glu Arg Thr Gln Ala Val Gly Arg Lys Val Asn Gln Ile Leu Asp Ser Tyr Pro Glu Val Lys Asp Tyr Ile Gly Ile Ser Gly Phe Ser Ile Met Gly Gly Glu Gln Ser Asn Thr Gly Thr Tyr Phe Val Val Leu Lys Asn Trp Asp Gln Arg Lys Gly Lys Glu His Thr Ala Ala Ala Val Val Glu Arg Phe Asn Glu Met Ala Tyr Gly Ile Gln Glu Ala Gln Ile Phe Ala Met Val Pro Pro Ala Ile Pro Gly Leu Gly Ala Ser Gly Gly Leu Gln Leu Gln Leu Glu Asp Arg Asn Asn Leu Gly Pro Thr Glu Met Gln Arg Ala Val Glu Thr Leu Met Ala Thr Tyr His Thr Gln Pro Ala Leu Ala Ser Ile Ser Ser Met Tyr Gln Ala Asn Val Pro Gln Tyr Phe Leu Asn Ile Asp Arg Asp Lys Val Gln Phe Met Gly Ile Gln Leu Asp Asn Val Phe Ser Thr Leu Ser Tyr Tyr Met Gly Ala Ala Tyr Val Asn Asp Phe Val Gln Phe Gly Arg Ile Tyr Gln Val Lys Ile Glu Ala Gly Glu Gln Ala Gln Lys Val Ile Asp Asp Val Leu Lys Leu Ser Val Pro Asn Ala Lys Gly Asp Met Val Pro Phe Ser Ser Phe Thr Lys Val Glu Glu Arg Leu Gly Met Asp Gln Ile Ser Arg Tyr Asn Met Tyr Ser Thr Ala Ser Ile Thr Cys Asn Val Ala Ser Gly Ser Ser Ser Gly Glu Gly Ile Gln Gln Met Glu Asp Leu Ile Lys Glu Gln Leu Gly Asn Glu Phe Gly Tyr Glu Trp Thr Ser Val Ala Tyr Gln Glu Thr Gln Ala Gly Asn Thr Thr Ile Val Phe Ile Met Ala Leu Leu Val Ala Phe Leu Val Leu Ala Ala Gln Tyr Glu Ser Trp Thr Ser Pro Leu Ser Ala Ile Met Gly Leu Pro Met Ala Leu Leu Gly Ala Met Ile Gly Cys Ser Val Met Gly Thr Pro Val Ser Ile Tyr Thr Gln Ile Gly Ile Ile Leu Leu Ile Ala Leu Ser Ala Lys Asn Gly Ile Leu Ile Val Glu Phe Ala Arg Asp Phe Arg Ala Glu Gly Asn Ser Ile Arg Asp Ala Ala Tyr Glu Ala Gly His Val Arg Leu Arg Pro Ile Leu Met 

1050

Thr Ser Phe Ala Phe Val Leu Gly Val Met Pro Leu Leu Phe Ala Thr
995 1000 1005

Gly Ala Gly Ala Gln Ser Arg Ile Ala Leu Gly Ala Ala Val Val Phe
1010 1015 1020

Gly Met Ala Leu Asn Thr Leu Leu Ala Thr Ile Tyr Ile Pro Asn Phe
1025 1030 1035 1040

Tyr Glu Leu Met Gln Lys Phe Gln Glu Asn Ile Leu Asp Arg Lys Lys

Lys Lys

<210> 5424 <211> 149 <212> PRT

<213> B.fragilis

<400> 5424

Met Leu Ser Leu Asn Leu Pro Val Phe Asp Thr Lys Ile Ala Thr Arg
1 5 10 15

Asn Gly Lys Asn Val Ile Phe Asp Val Ile Arg Arg Arg Tyr Val Ala 20 25 30

Leu Thr Pro Glu Glu Trp Val Arg Gln His Phe Val His Phe Leu Ile 35 40 45

Val His Lys Gly Tyr Pro Ser Ser Leu Met Ala Asn Glu Val Leu Leu 50 55 60

Asn Leu Asn Gly Thr Lys Lys Arg Cys Asp Thr Val Leu Tyr Lys Arg 65 70 75 80

Asp Leu Ser Ala Arg Met Ile Val Glu Tyr Lys Ala Pro His Ile Glu 85 90 95

Ile Thr Gln Ala Val Phe Asp Gln Ile Thr Arg Tyr Asn Met Val Leu 100 105 110

Lys Val Asp Tyr Leu Val Val Ser Asn Gly Met Gln His Tyr Cys Cys
115 120 125

Arg Met Asp Tyr Asp Thr Gln Ser Tyr Ser Phe Leu Ser Asp Ile Pro 130 135 140

Asp Tyr Asp Ala Leu

145

<210> 5425

<211> 141

<212> PRT

<213> B.fragilis

<400> 5425

Arg Leu Lys Pro Met Lys Ala Phe Leu Pro Leu Leu Ser Phe Phe 1 5 10 15

Phe Ile Ile Ser Cys Gln Gln His Lys Glu Ala Thr Ile Ser Pro Ile 20 25 30

Asp Glu Glu Asp Glu Leu Gln Glu Glu Ala Asp Ser Leu Pro Arg Ala 35 40 45

Thr Ala Ile Phe Trp Leu Asp Lys Tyr His Met Lys Glu Leu Lys Lys 50 55 60

Asp Asp Val Leu Thr Phe Arg Thr Ala Lys Ala Lys Val Ile Ile Arg 65 70 75 80

Asn Asp Gly Thr Ile Glu Leu Leu Ser Phe Val Glu Gln Gln Pro Gly 85 90 95

Asn Ala Gln Arg Tyr Ile Arg Tyr Arg Leu Lys Asp Phe Lys Val Lys 100 105 110

Lys Ile Leu Met Asp Asn Gly Tyr Ile Asn Pro Gly Glu Gln Tyr Val

120 Gln Leu Arg Tyr Ile Pro Ala Leu Ala Arg Arg Val Lys 130 135 <210> 5426 <211> 353 <212> PRT <213> B.fragilis <400> 5426 Met Met Glu Pro Thr Cys Met Ser Glu Asn Lys Lys Lys Ile Ile Phe Ile Val Asn Pro Ile Ser Gly Thr Gln Ser Lys Glu Leu Val Leu Ser 25 Leu Leu Asp Glu Lys Ile Asp Lys Glu Met Tyr Thr Trp Glu Ile Val Tyr Thr Glu Arg Ala Gly His Ala Ile Glu Ile Ala Ala Asp Ala Ala 55 Asp Lys Asn Thr Asp Ile Val Val Ala Val Gly Gly Asp Gly Thr Ile 70 75 Asn Glu Ile Ala Arg Ser Leu Val His Thr Asn Thr Ala Leu Gly Ile 85 90 Ile Pro Cys Gly Ser Gly Asn Gly Leu Ala Arg His Leu Gln Ile Ser 105 Met Asp Pro Arg Lys Ala Leu Glu Ile Leu Asn Asp Gly Ile Ile Asp 115 120 125 Ile Ile Asp Tyr Gly Lys Ile Asn Gly Thr Asp Phe Phe Cys Thr Cys 135 140 Gly Val Gly Phe Asp Ala Phe Val Ser Leu Lys Phe Ala Asn Ala Gly 150 155 Lys Arg Gly Leu Leu Thr Tyr Leu Glu Lys Thr Leu Gln Glu Ser Leu 165 170 Lys Tyr Gln Pro Glu Thr Tyr Glu Leu Glu Thr Glu Asp Gly Thr Ser 185 190 Lys Tyr Lys Ala Phe Leu Ile Ala Cys Gly Asn Ala Ser Gln Tyr Gly 200 205 Asn Asn Ala Tyr Ile Ala Pro Gln Ala Thr Leu Thr Asp Gly Leu Leu 215 Asp Val Thr Ile Leu Glu Pro Phe Thr Val Leu Asp Val Pro Ala Leu 235 230 Ala Phe Gln Leu Phe Asn Lys Thr Ile Asp Gln Asn Ser Arg Ile Lys 245 250 Thr Phe Arg Cys Lys Lys Leu Cys Ile His Arg Ser Ser Pro Gly Val 265 Val His Phe Asp Gly Asp Pro Met Gln Ala Asp Glu Asp Ile Lys Ile 280 Glu Leu Ile Gln Lys Gly Leu Arg Val Val Pro Gly Asp Lys Lys 295 300 Lys Asp Asn Pro Asn Val Leu Gln Lys Ala Gln Glu Tyr Val Asn Gly 310 315 Ile Lys Leu Ile Asn Glu Ala Ile Val Glu Asp Ile Ala His Lys Asn 330 325 Lys Val Ile Leu Lys Lys Asn Lys Gln Leu Ile Gln Lys Leu Thr Lys 345 Lys

<210> 5427 <211> 316

<212> PRT <213> B.fragilis

<400> 5427

Met Ile Met Pro Lys Asn Tyr Thr Leu Gln Asn Ala Ser Asn Leu Gly 10 Trp Leu Phe Tyr Lys Asp Tyr Tyr Arg Gln Glu Pro Asn Val Asp Phe Ile Ser Thr Gln Gly Lys Glu Ser Asp Thr Thr Ala Asp Phe Phe Arg 40 Lys Thr Asn Gln Arg Ile Thr Ala Tyr Gln Leu Asn Ser Glu Ser Pro 55 Leu Val Ala Ala Phe Asn Asn His Phe Gly Thr Pro Leu Gln Leu Lys 70 75 Thr Ile Tyr Pro Gly Leu Ile Thr Gly Ser Gly Leu Pro His Gln Thr 90 Gly Ser Lys Gly Glu Phe Lys Leu Gly Phe Gln Phe Asp Tyr Thr Thr 100 105 Gly Leu Pro Tyr Ile Pro Gly Ser Ser Ile Lys Gly Thr Leu Arg Ser 120 125 Met Phe Pro Phe Ser Leu Lys Asp Lys Gly Ser Thr Lys Arg Ile Leu 135 Pro Glu Tyr Arg Lys Glu Arg Met Glu Tyr Ile Arg Asp Leu Ile Ile 155 Glu Val Thr Asn Ile Asn Glu Ile Ser Asp Thr Glu Ile Gln Ala Leu 165 170 Glu Tyr Ala Ile Phe Thr Asn Ser Thr Pro Ser Gly Lys Thr Ile Glu 185 Phe Ser Leu Glu Glu Lys Asp Val Phe Tyr Asp Ala Phe Val Ala Asp 200 205 Ser Lys Asp Gly Val Met Leu Ser Asp Asp Tyr Ile Thr Pro His Gly 215 220 Glu Asn Pro Leu Lys Asp Pro Lys Pro Ile Leu Phe Leu Lys Ile Arg 230 235 Pro Asp Val Thr Ile Asn Phe Tyr Phe Lys Leu Cys Thr Thr His Leu 245 250 Tyr Lys Glu Lys Val Cys Ser Ser Lys Gln Ile Glu Glu Ile Lys Lys 260 265 Gln Asn Asp Phe Ser Ser Ser Tyr Lys Met Ile Thr Ala His Gln 280 Lys Arg Asn Leu Phe Glu Lys Ile Leu Leu Cys Ile Gly Ile Gly Ala 295 Lys Thr Asn Ile Gly Tyr Gly Gln Leu Lys Lys Leu 310 315

<210> 5428

<211> 93

<212> PRT

<213> B.fragilis

<400> 5428

Gly Glu Lys Phe Arg His Asn Gly Leu Asp Lys Ile Val Met Asp Phe Gly Ile Ala Phe Asn Ile Gly Lys Met Ile Asn Lys Gln Glu Lys Lys 25

Lys Arg Gly Arg Thr Asn Leu Leu Val Thr Ile Leu Ile Ser Cys Gly

40

Ile Ala Tyr Gln Lys Tyr Thr Lys Ala Ile Ile Leu Arg Gly Cys Pro

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ייני אייני איי
מייני אייני אייני
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. Lys Ser Lys Val Pro Pro Lys Ser Arg Ile Ala Pro Phe Thr Ile Val 70 Tyr Phe Gly Glu Lys Pro His Ile Thr Val Val Lys Asn <210> 5429 <211> 134 <212> PRT <213> B.fragilis <400> 5429 Leu Ile Asp Thr Ile Arg Asn Met His Ile Ser His Ile Ala Ile Trp Thr Thr Arg Leu Glu Glu Leu Arg Asn Phe Tyr Ile Thr Tyr Phe Asn 25 Gly Thr Ser Asn Glu Lys Tyr Ile Asn Pro Lys Lys Gly Phe Glu Ser 40 Tyr Phe Ile Ser Phe Asp Gln Gly Phe Ala Ser Leu Glu Ile Met Gln 55 Arg Glu Asp Ile Thr Thr Pro Ala Leu Lys Asp Cys Leu Gly Leu Ala His Phe Ser Phe Ser Val Gly Ser Lys Glu Ala Val Leu Glu Leu Thr 90 Glu Gln Leu Arg Lys Asp Gly Phe Val Ile Glu Ser Glu Pro Arg Thr 105 Thr Gly Asp Gly Tyr Phe Glu Ser Ala Ile Leu Asp Pro Glu Gly Asn 120 Ile Val Glu Ile Thr Ile 130 <210> 5430 <211> 236 <212> PRT <213> B.fragilis <400> 5430 Leu Arg Val Thr Leu Asp Arg Val Ile Glu Asp Lys Glu Leu Gly Arg Leu Val Val Arg Asp Asn Val Arg Ala Lys Arg Leu Val Phe Arg Thr 25 Lys Ala Asp Ala Ile Tyr Ile Ser Ile Pro Leu Gly Val Thr Met Arg 40 Glu Val Lys Glu Ala Ile Glu Lys Leu Arg Pro Arg Leu Leu Asp Ser Arg Gln Lys Leu Val Arg Pro Leu Ile Asp Leu Asn Tyr Arg Ile Glu Thr Glu Tyr Phe Lys Leu Ser Leu Val Ser Gly Lys Arg Glu Arg Phe 90 Leu Ala His Ser Glu Leu Gly Glu Met Arg Ile Ile Cys Pro Pro Thr 105 Ala Asp Phe Thr Asp Ser Asn Leu Gln Asp Trp Leu Arg Lys Val Ile 120 Glu Glu Ala Leu Arg Arg Asn Ala Lys Ile Ile Leu Pro Pro Arg Leu 135 Tyr Met Leu Ser Glu Lys His Arg Leu Pro Tyr Glu Ser Val Gln Ile 150 155 Asn Ser Ser Arg Gly Arg Trp Gly Ser Cys Ser Ser Arg Lys Lys Ile 165 170 Asn Leu Ser Tyr Phe Leu Val Leu Leu Pro Lys His Leu Ile Asp Tyr

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then then the street in street in the second street went street in the street street of the second street s
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180
                                185
Val Leu Leu His Glu Leu Cys His Thr Cys Glu Met Asn His Gly Asp
                           200
                                               205
Arg Phe Trp Asp Leu Leu Asn Gly Leu Thr Asp Gly Lys Ala Leu Glu
                       215
Leu Arg Glu Glu Leu Lys Arg Tyr Lys Thr Glu Ile
                    230
<210> 5431
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Pro Leu Lys Thr Asn Arg Ser Met Arg Asn Phe Phe Val Ser Ala Phe
Leu Leu Val Gly Ile Ala Val Met Thr Val Cys Arg Met Asn Asn
                                25
Lys Gln Cys Leu Ser Glu Leu Ala Leu Val Asn Val Glu Ala Leu Ala
Thr Gly Glu Gly Asp Val Pro Thr Ser Cys Tyr Gly Ser Gly Asn Val
                        55
Asp Cys Pro Ile Ser Asp Ser Lys Val Ser Tyr Val Met Asn Gly Arg
Ser Phe
<210> 5432
<211> 501
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<213> B.fragilis
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His Ser Arg Thr Asp Lys Thr Ile Arg Ile Met Ile Tyr Ser Tyr His
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Ile Phe Tyr Phe Pro Phe Lys Trp Glu Ile Met Gly Leu Glu Asn Gln
Ala Phe Ser Asp Gln Val Asn Leu Asp Asn Ile Gln Tyr Asn Arg Asn
Ser Tyr Trp Glu Arg Ser Gln Lys Pro Asp Pro Gly Glu Glu Ser
Leu Tyr Asn Glu Lys Asn Tyr Tyr Tyr Thr Phe Val His Asn Ile Leu
                    70
                                       75
Tyr Asp Glu Glu His Ser Pro Leu Asn Leu Ile His His Phe Glu Arg
                                   90
Lys Glu Pro Lys Leu Ser Asn His Ile Tyr Tyr Tyr Ile Lys Lys
                                105
Gly Arg Asn Asn Pro Tyr Lys Leu Ile Val Asp Ala Met Asn Ile Asn
                            120
                                               125
Leu Tyr Ala Thr Gly Val Gly Phe Leu Ser Phe Tyr Leu Lys Asn Glu
                        135
                                           140
Asp Cys Thr Gln Asn Ser Pro Glu Asp Ile Leu Ala Ile Asn Gln Tyr
                                       155
Gly Arg Arg Ile Met Pro Pro Phe Phe Asn Asp Thr Arg Leu Arg Asn
                165
                                    170
Glu Ile Ser Glu Tyr Ile Arg Ile Glu Gly Leu Asn Gln Thr Val Tyr
                                185
Phe Glu Asp Phe Lys Ser Tyr Thr Pro Tyr Asp Ser Trp Gln Pro Ser
                            200
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Ser Ser Ile Lys Lys Leu Ile Cys Glu Leu Val Thr Asn Leu Ser Ile 215 220 Asp Pro Ile Ile Asp Asp Arg Met Phe Val Ala Thr Trp Tyr Lys Asn 230 235 Asn Gln Leu Ser Gln Gln Phe Thr Asn Asn Ala Lys Ala Tyr Phe Asp 250 Ser Gln Asp Pro Phe Ser Asp Tyr Trp Tyr Arg Phe Leu Phe Ile Asp 265 Gly Ser Asn Ala Thr Cys Gln Asn Glu Lys Met Lys Lys Glu Leu Leu 280 Glu Glu His Thr Tyr Tyr Arg Trp Gln Gln Trp Ser Ser Leu Tyr Gly 295 300 Ile Ser Lys Tyr Ser Leu Val Tyr Leu Thr Asn Asn Glu Val Pro Asp 310 315 Tyr Leu Ile Glu Tyr Phe Gln Thr Ile Tyr Ala Arg Met Ala Glu Leu 325 330 Val Leu Val Gln Arg Ala Ser Met Leu Arg Phe Ser Gly Glu Ile Thr 345 Lys Val Ser Gln Leu Ser Asn Gln Asp Val Glu Ala Val Ser Lys Arg 360 Val Ser Ser Leu Tyr Lys Glu Tyr Ile Arg Phe Val Asn Gln Ile Tyr 375 380 Phe Arg Glu Ile Thr Ala Gln Asp Gln Gly Ile Glu Met Tyr Asn Lys 390 395 Leu His Ser Cys Leu Gln Met Glu Ser Tyr Ile Lys Asp Leu Asp Gly 405 410 Glu Ile Glu Glu Leu His Gln Tyr Ile Ser Leu Met Glu Asp Arg Glu 425 Arg Asn Lys Lys Ala Ser Leu Leu Asn Asp Ile Ala Thr Leu Phe Leu 440 Pro Ile Thr Val Ile Thr Gly Phe Trp Gly Met Asn Gln Ile Ser Glu 455 460 Val Met Glu Glu Asn Gly Glu Leu Ser Thr Gly Phe Ile Ile Gln Ser 470 475 Leu Leu Ile Ile Gly Thr Leu Cys Ala Ile Cys Ile Ile Tyr Lys 485 490 Arg Lys Arg Lys Leu 500 <210> 5433 <211> 265 <212> PRT <213> B.fragilis <400> 5433 Tyr Met Gly Thr Ile Asp Ile Ser Tyr Phe Asn Leu Leu Ile Gly Leu 10 Leu Leu Leu Val Ile Pro Leu Phe Tyr Leu Trp Lys Phe Lys Thr Gly

 400> 5433

 Tyr Met Gly Thr Ile Asp Ile Ser Tyr Phe Asn Leu Leu Ile Gly Leu

 1
 5
 10
 15

 Leu Leu Leu Leu Val Ile Pro Leu Phe Tyr Leu Trp Lys Phe Lys Thr Gly
 30

 Leu Leu Lys Ala Thr Leu Ile Gly Thr Ala Arg Met Ile Val Gln Leu
 35

 Phe Leu Ile Gly Met Tyr Leu Lys Tyr Leu Phe Leu Trp Asn Asn Pro
 45

 Phe Leu Ile Asn Phe Leu Trp Val Ile Ile Met Ile Phe Val Ala Gly Gln
 60

 Trp Ile Asn Phe Leu Trp Val Ile Ile Met Ile Phe Val Ala Gly Gln
 80

 Thr Ala Leu Val Arg Thr Gly Leu Lys Arg Glu Ile Leu Leu Ile Pro
 90

 11e Ser Val Gly Phe Leu Cys Ser Val Val Leu Val Gly Met Tyr Phe

 100
 100

Ile Gly Ile Val Leu Gln Leu Asp Asn Val Phe Ser Ala Gln Tyr Phe 120 125 Ile Pro Ile Phe Gly Ile Leu Met Gly Asn Met Leu Ser Ser Asn Val 135 Ile Ala Leu Asn Thr Tyr Tyr Ser Gly Leu Lys Arg Glu Gln Gln Leu 150 155 Tyr Cys Tyr Leu Leu Gly Asn Gly Ala Thr Arg Gln Glu Ala Gln Ala 165 170 Pro Phe Ile Arg Glu Ala Ile Ile Lys Ser Phe Ser Pro Leu Ile Ala 185 Asn Ile Ala Val Met Gly Leu Val Ala Leu Pro Gly Thr Met Ile Gly 200 Gln Ile Leu Gly Gly Ser Ser Pro Asn Val Ala Ile Lys Tyr Gln Met 215 220 Met Ile Met Val Ile Thr Phe Thr Ala Ser Met Leu Ser Leu Met Ile 230 235 Thr Ile Ser Leu Ala Ser Arg Lys Ser Phe Asp Glu Tyr Gly Arg Ile 245 Leu Gln Val Thr Lys Glu Ser Gln Lys 260

<210> 5434 <211> 667 <212> PRT <213> B.fragilis

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Cys Gln Thr Leu Gln Glu Val Phe Asp Phe Ile Asn Tyr Trp Asp Val 265 Glu Arg Lys Asn Leu Asn Val Ala Thr Asp Gly Ile Val Leu Lys Val 280 Asn Ser Leu Lys Gln Gln Arg Asn Leu Gly Phe Thr Ala Lys Ser Pro 295 Arg Trp Ala Ile Ala Tyr Lys Phe Gln Ala Glu Arg Ala Leu Thr Arg 310 Leu Asn Met Val Thr Tyr Gln Val Gly Arg Thr Gly Ala Val Thr Pro 325 330 Val Ala Asn Leu Asp Pro Val Gln Leu Ser Gly Thr Val Val Lys Arg 345 Ala Ser Leu His Asn Ala Asp Ile Ile Glu Gly Leu Asp Leu His Ile 360 365 Gly Asp Met Val Tyr Val Glu Lys Gly Glu Ile Ile Pro Lys Ile 375 Thr Gly Val Asp Thr Ser Ala Arg Phe Met Ile Gly Glu Lys Val Lys 390 395 Phe Ile Thr His Cys Pro Glu Cys Gly Ser Lys Leu Ile Arg Tyr Glu 410 Gly Glu Ala Ala His Tyr Cys Pro Asn Glu Thr Ala Cys Pro Pro Gln 420 . 425 Ile Lys Gly Lys Ile Glu His Phe Ile Ser Arg Lys Ala Met Asn Ile 440 Asp Gly Leu Gly Pro Glu Thr Ile Asp Met Phe Tyr Arg Leu Gly Leu 455 Ile Arg Asp Thr Ala Asp Leu Tyr Gln Leu Thr Thr Asp Asp Ile Arg 475 Gly Leu Asp Arg Met Gly Asp Lys Ser Ala Glu Asn Ile Ile Lys Gly 485 490 Ile Met Gln Ser Lys Glu Val Pro Phe Glu Arg Val Ile Phe Ala Leu 505 Gly Ile Arg Phe Val Gly Glu Thr Val Ala Lys Lys Ile Ala Lys Ser 520 525 Phe Lys Asp Ile Glu Glu Leu Glu Asn Ala Asp Leu Glu Thr Leu Ile 535 540 Asn Ile Asp Glu Ile Gly Glu Lys Ile Ala Arg Ser Ile Leu Asn Tyr 550 555 Phe Ala Asn Glu Ser Asn Arg Lys Leu Val Asp Arg Leu Lys Thr Ala 570 Gly Leu Gln Leu Tyr Arg Pro Glu Glu Asp Leu Ser Gly His Thr Asp 585 Lys Leu Ala Gly Gln Ser Ile Val Ile Ser Gly Val Phe Thr His His 600 Ser Arg Asp Glu Tyr Lys Asp Leu Ile Glu Lys His Gly Gly Lys Asn 615 620 Val Gly Ser Ile Ser Ser Lys Thr Ser Phe Ile Leu Ala Gly Asp Asn 630 635 Met Gly Pro Ala Lys Leu Glu Lys Ala Ser Lys Leu Gly Ile Lys Ile 650 645 Met Asn Glu Glu Glu Phe Leu Lys Leu Ile Ser

665

<210> 5435

<211> 202

<212> PRT

<213> B.fragilis

660

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<211> 604

<212> PRT

<213> B.fragilis

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Asn Asn Asn Ala Met Lys Tyr Ile Ala Ile Thr Leu Gly Pro Ile Thr

1 10 15

Arg Thr Ile Glu Met Ala Glu Ser Thr Lys Glu Leu Trp Ala Ala Ser 20 25 30

Tyr Phe Phe Ser Tyr Leu Ala Lys Lys Ile Val Glu Pro Phe Val Lys 35 40 45

Lys Asn Arg Thr Phe Gln Leu Pro Leu Ile Asn Glu Glu Met Gln Lys 50 55 60

Pro His Cys Gly Ala Gly Leu Phe Pro Asp Arg Tyr Ile Phe Lys Ser 65 70 75 80

Glu Pro Glu Asp Leu Glu Leu Leu Lys Gln His Ser Asp Gln Val Leu 85 90 95

Ile Glu Ile Ala Gly His Ile Ala Ser Pro Ser Leu Pro Gly Thr Ala

100 105 110 Lys Asp Val Ser Glo Tle Tyr His Tyr Leu Lys Ser Tyr Tle Lys Tle

Lys Asp Val Ser Gln Ile Tyr His Tyr Leu Lys Ser Tyr Ile Lys Ile 115 120 125

Tyr Phe Ile Glu Arg Thr Leu Glu Ser Asp Asp Pro His Val Val Ile 130 135 140

Pro Ala Cys Glu Lys Tyr Leu Asn Ile Ile Glu Asn Gln Glu Thr Phe 145 150 155 160

Pro Glu Gln Glu Glu Thr Met Ile Ser His Gln Lys Ser Asp Phe Leu 165 170 175

Lys Phe Leu Ile Thr Asn Val Asn Gly Lys Ile Tyr Arg Lys Asp Lys
180 185 190

Asn Ser Ile Pro Arg Phe Thr Gly Ser Phe Leu Thr Arg Asp Ala Phe 195 200 205

Gly Asp Met Asn Gly Glu Arg Leu Phe Glu Ser Ile Leu Glu Ile Ser 220 215 Ala Ser Glu Leu Asn Ile Asn Ile Gln Gln Lys Ala Leu Glu Val Ile 230 235 Thr Ala Asn Glu Lys Asn Lys Gly Glu Lys Tyr Ser Asp Gln Ile Trp 250 Asp Ala Glu Glu Ile Ile Leu Asn Asp Asn Lys Ala Gln Leu Arg Pro 265 Tyr His Lys Tyr Ile Ala Ile Ile Lys Ser Asp Gly Asp Ser Met Gly 280 Glu Thr Ile Lys Ser Met Gly Ala Tyr Asn Ile Pro Ile Thr Gln Leu 295 Ser Lys Ala Leu Leu Ser Phe Asn Ile Glu Ser Ile Asn Glu Ile Val 315 310 Ala Tyr Gly Gly Lys Pro Ile Phe Ile Gly Gly Asp Asp Leu Leu Cys 330 325 Phe Ala Pro Val Cys Cys Asn Gly Asn Asn Val Phe Asn Leu Val Glu 345 340 Lys Leu Ser Thr Cys Phe Asp Gln Cys Ile Asn Gln His Leu Gln Gln 360 Tyr Ile Asn Ala Cys Ser Glu Ala Gln Arg Pro Leu Pro Ser Leu Ser 375 380 Phe Gly Ile Ser Ile Thr Tyr His Lys Tyr Pro Met Phe Glu Ala Leu 395 390 His Thr Thr Asp Tyr Leu Leu Glu Met Val Ala Lys Asp Asn Leu Phe 410 405 Lys Tyr Thr Leu Ser Asn Lys Asn Ile Leu Asn Glu Asn Met Lys Arg 425 Phe Ile Leu Lys Asn Lys Leu Ala Phe Ser Leu Gln Lys His Ser Gly 440 445 Gln Ile Tyr His Thr Ala Met Ser Lys Lys Gly Lys Ser Tyr Val Lys 455 Phe Asn Met Leu Leu Gln Lys Tyr Ile Leu Lys Asn Lys Asp Met Ser 470 475 Lys Thr Gln Glu Ser Glu Lys Phe Leu Ser Ser Val Ile Gln Met Ile 490 Arg Ala His Ala Glu Ile Leu Gln Ile Ile Leu Gln Asn Glu Asp Lys 500 505 Arg Thr Glu Met Leu Lys Asn Tyr Phe Asp Asn Asn Phe Asn Glu Ser 520 Cys His Leu Gly Tyr Thr Gly Leu Phe Glu Asp Ile Gln Thr Leu Leu 535 540 Cys Leu Arg Tyr Gln Glu Asn Ile Gln Asp Tyr Gln Asn Arg Asn Glu 550 555 Ile Ile Gln Gln Asn Thr Ile Leu Thr Ser Asp Glu Lys Glu Ile Leu 570 565 Ile Val Ser Pro Ala Met Asp Ala Ile His Thr Ile Phe Thr Ala Leu 585 Gln Phe Ile His Phe Ile Asn Tyr Asn Lys Asp Glu <210> 5437 <211> 305

<212> PRT

<213> B.fragilis

<400> 5437

Thr Ile Met Ala Asp Leu Ser Val Asn Ile Gly Lys Leu Gln Met Lys 1 5 10 15

2247

Asn Pro Val Met Thr Ala Ser Gly Thr Phe Gly Tyr Gly Glu Glu Phe 25 Ala Asp Phe Ile Asp Ile Thr Arg Ile Gly Gly Ile Ile Val Lys Gly 40 Thr Thr Leu His Lys Arg Glu Gly Asn Pro Tyr Pro Arg Met Ala Glu Thr Pro Ser Gly Met Leu Asn Ala Val Gly Leu Gln Asn Lys Gly Val 70 75 Glu Tyr Phe Ser Asn His Ile Tyr Pro Arg Ile Lys Asp Ile Gln Thr 90 His Met Ile Val Asn Val Ser Gly Ser Ala Ile Glu Asp Tyr Val Lys 105 100 Thr Ala Glu Ile Ile Asn Glu Leu Asp Lys Ile Pro Ala Ile Glu Leu 120 Asn Ile Ser Cys Pro Asn Val Lys Gln Gly Gly Met Ala Phe Gly Val 135 140 Thr Thr Lys Gly Val Ser Glu Val Val Gln Ala Val Arg Ser Ala Tyr 150 155 Lys Lys Thr Leu Ile Val Lys Leu Ser Pro Asn Val Thr Asp Ile Ala 165 170 Glu Met Ala Arg Ala Ala Glu Ala Asn Gly Ala Asp Ser Val Ser Leu 185 Ile Asn Thr Leu Leu Gly Met Ala Ile Asp Ala Glu Arg Lys Arg Pro 200 Ile Leu Ser Thr Val Thr Gly Gly Met Ser Gly Ala Ala Val Lys Pro 215 Ile Ala Leu Arg Met Val Trp Gln Val Ala Lys Ala Val Asn Ile Pro 235 230 Val Ile Gly Leu Gly Gly Ile Met Asn Trp Lys Asp Ala Val Glu Phe 250 245 Met Leu Ala Gly Ala Ser Ala Ile Gln Ile Gly Thr Ala Asn Phe Ile 260 265 Asp Pro Ala Ile Thr Ile Lys Val Ile Asp Gly Ile Asn Asp Tyr Leu 280 Glu Arg His Gly Cys Lys Ser Val Pro Glu Ile Ile Gly Ala Leu Glu 295 Val 305 <210> 5438 <211> 431 <212> PRT <213> B.fragilis <400> 5438 Tyr Asp Met Ala Lys Ile Gln Ile Lys Ser Glu Lys Leu Thr Pro Phe Gly Gly Ile Phe Ser Ile Met Glu Lys Phe Asp Ser Met Leu Ser Pro 2.5 Val Ile Asp Ser Thr Leu Gly Gln Arg Cys Ser Ser Ile Phe Gly Tyr 40 Gln Phe Ser Glu Ile Val Arg Ser Leu Met Ser Val Tyr Phe Cys Gly 55 Gly Ser Cys Val Glu Asp Val Thr Ser Gln Leu Met Arg His Leu Ser

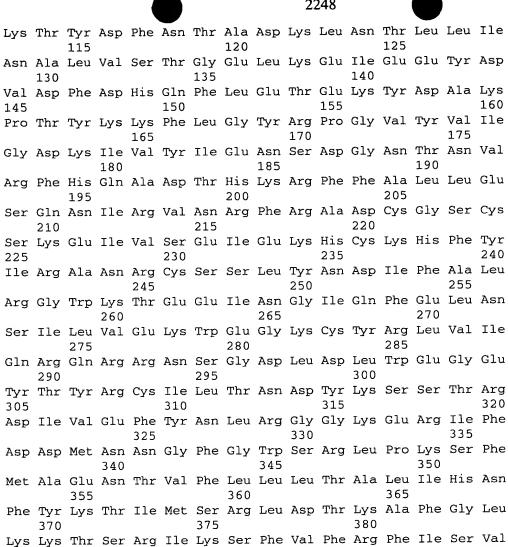
85 90 95

Ile Lys Glu Leu Thr Gln Glu Asn Ile Ser Tyr Thr Ser Asp Gln Gly
100 105 110

Tyr His Pro Thr Leu Arg Thr Cys Ser Ser Asp Thr Ile Leu Arg Ala

395

410



<210> 5439 <211> 761 <212> PRT <213> B.fragilis

<400> 5439 Ile Tyr Asn Leu Asn Met Pro Asp Tyr Tyr His Ser Ile Thr Thr Leu 10 His Ala Leu Gln Asn Ala Trp Arg Ala Val Arg Ala Lys Asn Ala Ala 25 Gly Gly Ile Asp Gly Phe Thr Leu Ser His Phe Glu Lys Arg Leu Asn 40 Asp Asn Leu Ile Glu Leu Gln His Glu Leu Ile Ser Gln Thr Trp Asn 55 Pro Glu Pro Tyr Leu Arg Ile Glu Ile Thr Lys Asn Glu Thr Glu Lys 75 70 Arg Lys Leu Gly Leu Leu Cys Ile Lys Asp Lys Ile Val Gln Gln Ala

Pro Ala Lys Trp Ile Met Thr Ala Arg Gln Tyr Val Leu Asn Ile Tyr

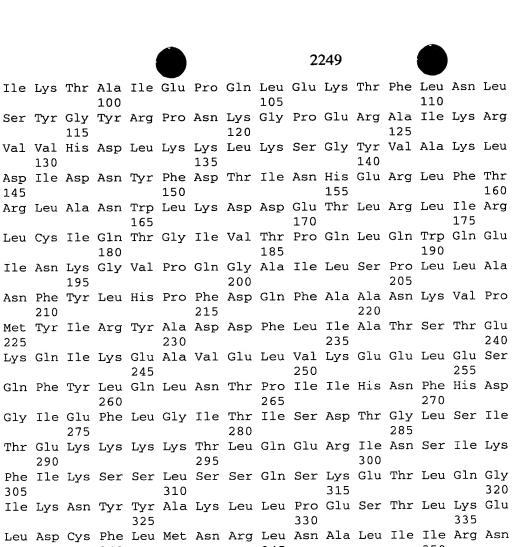
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Thr Glu Asn Arg Ala Tyr Ala Lys Pro Phe Lys Thr Glu Phe Gly

390

405

420



345 Gln Asn Ser Ile Asn Asn Lys Lys Glu Leu Val Ser Asn Leu Gln Lys 360 365 Ile Glu Phe Tyr Ser Glu Asn Ser Asn Lys Asn Lys Ser Gln Leu Ile 380 375 Gln Gln Leu Cys Ser Thr Tyr Ile Val His Ser Thr Lys Ser Lys Thr 390 395 Arg Leu Thr Ser Thr His Ile Asp Asn Thr Lys Leu Ile Thr Gln Lys 405 410 Lys Lys Glu Tyr Gln Lys Arg Glu Asn Glu Gly Ala Glu Leu Val Ile 425 Ser Ile Pro Gly Ser Tyr Ile Gly Ala Thr Tyr Lys Gly Ile Thr Val 440 Lys Leu Gln Gly Lys Ile Ile Asn Lys Pro Ser Pro Ala Leu Lys His 455 460 Ile Thr Val Val Gly Lys Gly Ile Ser Leu Ser Ser Asn Ala Ile Thr 470 475 Tyr Cys Met Asn His Lys Ile Pro Ile Asp Phe Phe Asp Gly Arg Gly 490 Lys Gln Tyr Gly Thr Val Leu Asn Pro Val Phe Leu Asp Val Thr Leu 505 Trp Asn Lys Gln Val Glu Leu Pro Leu Glu Gln Lys Ile Lys Leu Ala 520 525 Thr Gln Ile Ile Gly Lys Leu Lys Asn Gln Leu Asn Leu Ile Lys 535 Tyr Tyr His Lys Tyr His Lys Asp Ile Leu Gly Gly Lys Leu Ser Glu 555 550 Lys Tyr Val Glu Val Val Leu Lys Ile Asp Lys Leu Ile Glu Lys Ala

2250 565 570 Lys Asn Tyr Ser Gln Arg Asn Glu Lys Tyr Thr Ala Glu Leu Met Ala 585 Ile Glu Ser Gln Ala Ala Ile Ala Tyr Trp Ser Tyr Ile Arg Val Leu 600 Thr Ala Asp Asp Gly Ile Asp Phe Ile Arg Arg Glu His Gln Gly Ala 615 Thr Asp Leu Leu Asn Ser Leu Leu Asn Tyr Gly Tyr Ala Ile Leu Tyr 630 635 Ala Arg Val Trp Lys Asn Ile Leu Ala Ala Lys Leu Asn Pro Ser Ile 650 Gly Val Leu His Ala Lys Gln Asp Gly Lys Pro Thr Leu Val Phe Asp 665 Val Val Glu Leu Phe Arg Ala Gln Met Val Asp Arg Val Val Ile Ser 680 Leu Ile Gln Lys Lys Val Ser Leu Lys Met His Asp Gly Leu Leu Asn 695 700 Glu Ser Ser Lys Arg Val Leu Ile Arg Tyr Ile Leu Glu Arg Leu Asn 710 715 Arg Tyr Glu Lys Tyr Arg Gly Glu Glu Ile Thr Phe Ser Gln Ile Ile 730 725 Leu Arg Gln Ala Gln Glu Ile Ala Leu Phe Ile Ser Gly Asp Asn Leu

Ile Phe Lys Pro Tyr Val Ala Lys Trp 755

<210> 5440

<211> 72

<212> PRT

<213> B.fragilis

<400> 5440

Ser His Asn Phe Pro Phe Lys Trp Lys Ile Lys Tyr Val Ile Thr Ile 10

Tyr His Asn Ser Asn Ser Phe Ile Cys Ser Thr Met Leu Ser Ile Ser 25

Phe Val Val Arg Arg Leu Arg Thr Val Pro Ile Asn Pro Leu Ile Pro 40

Pro Pro Gln Lys Ile Leu Leu Ile Gly Val Tyr Arg Phe Asn Ile Phe

Trp Ile Glu Phe Ile Pro Phe Pro

<210> 5441

<211> 345

<212> PRT

<213> B.fragilis

<400> 5441

Arg His Thr Tyr Ile Tyr Met Ala Lys Gln Glu Leu Thr Cys Asp Asp 10

Ile Leu Lys Glu Leu Arg Ala Lys Gln Tyr Arg Pro Ile Tyr Tyr Leu 25

Met Gly Glu Glu Ser Tyr Tyr Ile Asp Leu Ile Ala Asp Tyr Ile Thr

Asp Asn Val Leu Thr Asp Thr Glu Lys Glu Phe Asn Leu Thr Val Val 55

Tyr Gly Ala Asp Val Asp Val Ala Thr Val Ile Asn Ala Ala Lys Arg 70 75

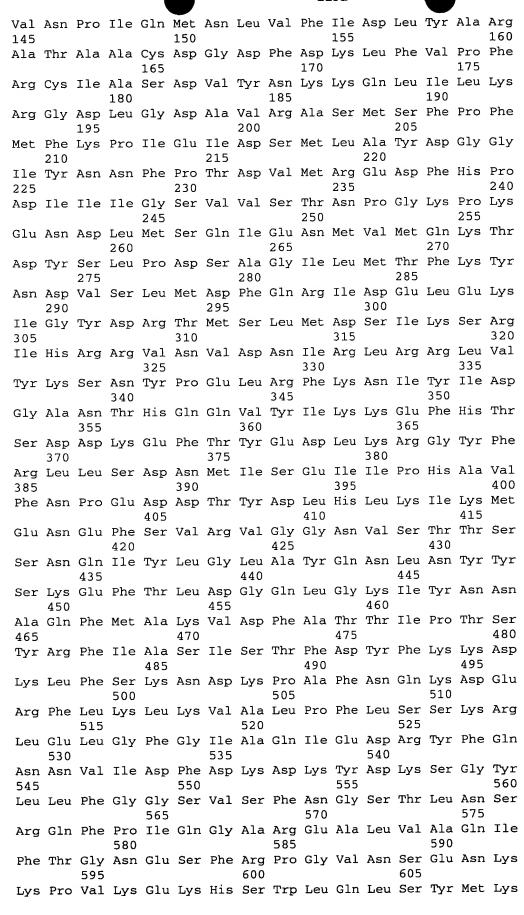
Tyr Pro Met Met Ser Glu His Gln Val Val Ile Val Lys Glu Ala Gln 90 Ala Ile Arg Asn Ile Glu Glu Leu Ser Tyr Tyr Leu Gln Lys Pro Leu 105 Asn Ser Thr Ile Leu Val Val Cys His Lys His Gly Ala Leu Asp Arg 120 Arg Lys Lys Leu Ala Ala Glu Ile Glu Lys Thr Gly Ile Leu Phe Glu 135 140 Ser Lys Lys Ile Lys Glu Ala Gln Leu Pro Ala Phe Ile Ser Ser Tyr 155 Met Lys Arg Lys Gly Ile Asp Met Glu Pro Lys Ala Thr Ala Met Leu 170 165 Ala Asp Phe Val Gly Thr Asp Leu Ser Arg Leu Thr Gly Glu Leu Glu 185 Lys Leu Ile Ile Thr Leu Pro Gly Gly Gln Lys Arg Val Thr Pro Glu 200 Gln Ile Glu Lys Asn Ile Gly Ile Ser Lys Asp Tyr Asn Asn Phe Glu 215 220 Leu Arg Ser Ala Leu Val Glu Lys Asp Val Leu Lys Ala Asn Lys Ile 235 230 Ile Lys Tyr Phe Glu Glu Asn Pro Lys Thr Asn Pro Ile Gln Met Thr 250 Leu Ser Leu Leu Phe Asn Phe Tyr Ser Asn Leu Met Leu Ala Tyr Tyr 265 Ala Pro Asp Lys Ser Glu Gln Gly Val Ala Thr Met Leu Gly Leu Lys 280 Thr Pro Trp Gln Ala Arg Asp Tyr Leu Thr Ala Met Arg Lys Tyr Thr 295 Gly Val Lys Thr Met Gln Ile Val Gly Glu Ile Arg Tyr Ala Asp Ala 310 315 Lys Ser Lys Gly Val Gly Asn Thr Ser Ile Ser Asp Gly Asp Ile Leu 330 325 Arg Glu Leu Val Phe Lys Ile Leu His 340

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<400> 5442

Phe Asn Pro Leu Tyr Ser Val Leu Leu Asp Leu Met Lys Lys Asn Leu Leu Leu Phe Leu Phe Leu Phe Leu Pro Met Leu Val Gln Ala 25 Gln Lys Val Gly Leu Val Leu Ser Gly Gly Gly Ala Lys Gly Leu Thr 40 His Ile Gly Ile Ile Arg Ala Leu Glu Glu Asn Asn Ile Pro Ile Asp 55 60 Tyr Ile Thr Gly Thr Ser Met Gly Ala Ile Val Gly Ser Leu Tyr Ala 70 75 Met Gly Tyr Ser Pro Asp Asp Met Glu Thr Leu Leu Lys Ser Glu Asp 85 90 Phe Lys Arg Trp Tyr Ser Gly Glu Val Glu Lys Tyr Met Tyr Tyr 105 Phe Lys Lys Asn Leu Pro Thr Pro Glu Phe Phe Asn Ile Arg Phe Ser 120 125 Phe Lys Asp Ser Leu Ser Leu Lys Pro Gln Phe Leu Pro Thr Ser Val 135 140

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615
                                            620
Glu Lys Tyr His Lys Met Gly Ala Asn Trp Ile Leu Gly Trp Tyr Leu
                   630
                                       635
Asp Ala Val Tyr Ala Ser Lys Asn Phe Ser Glu Asn Tyr Thr Ala Thr
                645
                                    650
Met Met Gln Ala Ser Glu Phe Ala Pro Thr Ala His Ser Lys Leu Thr
                                665
Tyr Asn Glu Ala Phe Arg Ala Asn Gln Tyr Val Ala Ala Gly Ile Arg
                            680
Pro Ile Tyr Arg Leu Asn Gln Met Phe His Val Arg Gly Glu Phe Tyr
                       695
Gly Phe Leu Pro Ile Phe Pro Ile Glu Arg Asn Ser Ile Asn Lys Ala
                   710
                                        715
Tyr Tyr Gly Lys Ala Phe Ser Arg Phe Glu Tyr Leu Gly Glu Ile Ser
               725
                                   730
Val Val Cys Gln Leu Pro Phe Gly Ala Ile Ser Ala Tyr Val Asn His
                               745
           740
Tyr Ser Ser Pro Arg Arg Glu Trp Asn Val Gly Leu Thr Leu Gly Trp
                           760
Gln Leu Phe Asn Tyr Arg Phe Ile Glu
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Val Ala Met Tyr Gly Asn Gly Val Thr Ile Gly Thr Leu Lys Asn Thr
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Leu Lys Thr Val Asn Leu Ser Ile Pro Asp Gly His Leu Met Val His
                                25
Leu Pro Phe Ser Ala Gly Ser Cys Glu Val Val Val Gly Val Val Leu
                           40
Gln Lys Ala Ala Glu Cys His Ile Leu Thr Met Thr Cys Gln Thr Ile
Val Met Asn Met Glu Val Leu Gly Leu Phe
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Pro Lys Asn Leu Lys Ser Ser Arg Thr Met Thr Ser Thr Asp Ser Ile
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Leu Gln Leu Ile Ser Glu Ile His Ile Pro Gly Phe Phe Ile Thr Val
                                25
Asp Phe Leu Gln Ile Gly Lys Ala Ile Pro Gln Gly Ile Ser Gly Phe
                           40
Leu Lys Glu Lys Tyr Asp Lys Ile Ser His Gly Ala Ser Gly Arg Lys
                       55
Phe Ile Tyr Gln Lys Ser Gly Trp Arg Met Ala Phe Thr Phe Tyr Pro
                   70
                                        75
Thr Asp Arg Val Val Asp Glu Lys Tyr Ala Met Lys Asn Lys Met Ile
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THE STATE OF STATE OF

Lys Lys Arg

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<213> B.fragilis
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Leu Pro Val His Arg Ile Ile Tyr Leu Gln Lys Lys Phe Pro Lys Ser
Leu Gln Ile Gln Glu Lys Ala Val Ser Leu His Pro Leu Asn Lys Asn
                                25
Asn Gly Arg Val Ala Gln Leu Asn Arg Val Ala Asp Tyr Gly Ser Ala
                            40
Gly Tyr Arg Phe Glu Ser Cys Arg Asp His Phe Lys Val
<210> 5446
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Lys Thr Asn His Met Thr Thr Arg Met Tyr Val Ile Asn Thr Leu Ser
Asn Met His Val Gly Ser Gly Glu Val Asn Tyr Gly Val Ile Asp Asn
                                25
Leu Ile Gln Arg Asp Ser Val Thr Asn Leu Pro Asn Ile Asn Ser Ser
                            40
Gly Leu Lys Gly Ala Ile Arg Glu Tyr Phe Lys Glu Asn Glu Asn Leu
                        55
Val Arg Glu Leu Phe Gly Ser Ala Pro Lys Asp Glu Lys Thr Leu Pro
Gly Lys Val Arg Phe Phe Glu Ala Asn Leu Leu Ser Met Pro Val Arg
                85
                                    9.0
Ser Asp Lys Val Pro Phe Leu Met Ala Thr Ser Asp Glu Val Leu Gln
            100
                                105
Glu Leu Ile Thr Lys Met Lys Phe Phe Asn Cys Glu Glu Ala Thr Gln
                            120
Tyr Ile Ser His Leu Ser Thr Leu Leu Asp Asn Ile Lys Thr Gln Ala
                        135
Gln Gly Thr Asp Phe Ala Tyr Val Phe Asp Pro Ser Leu Gln Gly Ala
                    150
                                        155
Ile Ile Glu Glu Val Ser Ile Arg Ala Thr Cys Pro Ser His Ile Pro
                165
                                    170
Leu Gln Leu Ser Leu Lys Lys Leu Leu Gly Asp Arg Leu Val Ile Leu
                                185
Ser His Lys Tyr Phe Ser Ile Leu Ser Asp Asp Asn His Leu Pro Val
                            200
                                                205
Leu Ser Arg Asn Asn Leu Glu Asn Gly Gln Ser Ala Asn Leu Trp Tyr
                        215
                                            220
Glu Gln Val Leu Pro Arg Tyr Ser Arg Leu Tyr Phe Met Leu Met Asp
                    230
                                        235
Gly Asn Ala Gln Ser Glu Tyr Leu Lys Lys Phe Arg Asp Thr Leu Cys
                                    250
Thr Pro Ser Thr Ile Ile Gln Ile Gly Ala Asn Ala Ser Ile Gly Tyr
                                 265
Gly Tyr Cys Gln Ile Ser Glu Leu Ser Pro Phe
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Ser Val Trp Met Tyr Ile Ala Val Thr Asp Pro Gly Tyr Gly Asn Glu
                               25
Gln Asn Asp Glu Phe Met Lys Asn Met Gly Ile Glu Ala Phe Val Lys
                            40
Tyr Asn Tyr Phe His Lys Glu Gln Lys Arg Thr Trp Asn Lys Asp Ala
Phe Thr Ile Gln Asn Leu Lys Lys Ala Ser Ile Ala Gly His Leu Pro
                                        75
Ser Ile Phe Ile Leu Asn Arg Tyr Phe Tyr Lys Arg Ser Ser Ala Leu
               85
                                   90
Lys His Phe Thr Asn Leu Pro Ile Ala Lys Ser Ile Cys Ser Leu Glu
                                105
Cys Val Ala Ile Asn Glu Lys Arg Ile Asn Val Ser Phe Gly Glu His
                            120
Ala Gly Gly Thr Thr Gly Phe Thr Asn Thr Pro Ser Ser Asn Asn Ile
                       135
Leu Val Thr Ile Asn Val Phe Ser Ile Ser Arg Thr Tyr Arg Gly Met
                   150
                                       155
Ile Gly Val Glu Val Cys Pro Ile Ser Lys Pro Ser Ser Arg Lys His
                                    170
Phe Lys Glu
<210> 5448
<211> 265
<212> PRT
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Gly Ser Asn Lys Lys Asp Met Gln Lys Gln Ala Lys Glu Ile Lys Lys
His Leu Phe Leu Gly Gly His Asp Leu Glu Met Gln Thr Ile Val
                                25
Gln Ile Leu Thr Asp Arg Asn Val Ile Phe Lys Asp Arg Tyr Leu Gln
Trp Asp Asn Ala Leu Leu Ser Gln Tyr Glu Glu Glu Ile Gln Gln Tyr
                       55
Gly Asn Lys Glu Pro Phe Ile Ile Tyr Gly Val Glu Leu Lys Glu Asp
                   70
                                        75
Ile Thr Pro Pro Thr Asn Tyr Ile Arg Ile Asp His His Asn Glu Tyr
               85
                                    90
Ala Thr Tyr Pro Ser Ala Leu Glu Gln Val Ala Ser Ile Leu Asp His
           100
                               105
Pro Leu Asn Arg Tyr Gln Thr Leu Val Ala Ala Asn Asp Lys Ala Tyr
                           120
                                                125
Ile Pro Gly Met Leu Glu Ile Gly Ala Ser His Glu Glu Ile Asn Leu
                       135
                                            140
Ile Arg Gln Glu Asp Arg Lys Ala Gln Gly Val Ile Glu Asp Asp Glu
                   150
                                        155
Lys Leu Ala Gln Glu Ala Ile Thr Asn Gly Thr Glu Lys Ile Gly Ser
                165
                                    170
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Leu Tyr Val Val Phe Thr Thr Ala Asn Lys Phe Ser Pro Ile Cys Asp 180 | 180 | 180 | 180 | 185 | 185 | 185 | 185 | 190 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 180 | 18
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<400> 5449

Lys Arg Asn Lys Met Lys Thr Ile Phe Arg Met Leu Ser Val Leu Leu 10 Leu Thr Thr Gly Leu Leu Ser Ser Cys Ile Gln Ile Gly Glu Gly Ile 25 Gln Pro Ser Lys Lys Leu Ile Thr Arg Asp Tyr Lys Val Lys Glu Phe 40 Asn Lys Ile Asp Ala Gly Thr Val Gly Asn Ile Tyr Tyr Thr Gln Ser 55 Thr Asp Gly Lys Thr Asp Leu Gln Ile Tyr Gly Pro Asp Asn Ile Val 70 75 Ala Leu Ile Gln Val Ala Val Lys Asp Asn Thr Leu Phe Leu Ser Ile 85 90 Asp Lys Ser Lys Lys Val Arg Asn Phe Lys Lys Met Lys Ile Thr Ile 100 105 Thr Ser Pro Thr Leu Asn Gly Ile Ser Phe Lys Gly Val Gly Asp Val 120 125 His Ile Glu Asn Gly Leu Thr Thr Asp Asn Leu Asp Ile Glu Ser Lys 135 140 Gly Val Gly Asn Val Asp Ile Gln Ser Leu Thr Cys Gln Lys Leu Asn 150 155 Val Gln Ser Met Gly Val Gly Asp Val Lys Leu Glu Gly Thr Ala Gln 165 170 Ile Ala Ala Leu His Ser Lys Gly Val Gly Asn Ile Glu Ala Gly Asn 185 Leu Arg Ala Asn Ala Val Glu Ala Ser Ser Gln Gly Val Gly Asp Ile 200 205 Thr Cys Asn Ala Thr Glu Ser Ile Asp Ala Ala Val Arg Gly Val Gly 215 220

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<213> B.fragilis

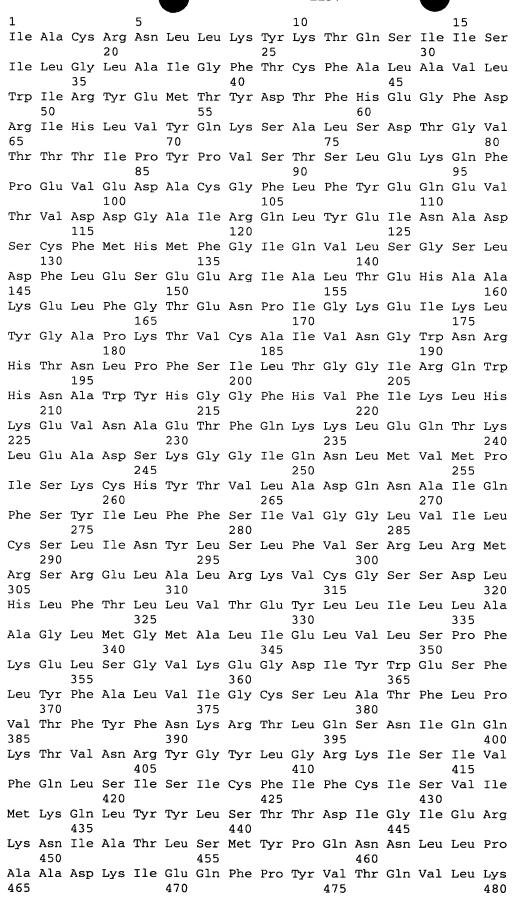
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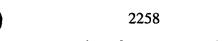
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Ser Ile Lys Tyr Lys Gly Ser Pro Thr Ile Lys Ser Leu Ser Lys Lys

230

Gly Val Gly Thr Ile Lys Asn Ile 245





									2	258					
Gly	His	Phe	Ser	Leu 485	Leu	Pro	Lys	Thr	Ala 490	Ser	Met	Ala	Met	His 495	Phe
			500				Pro	505					510		
		515					Leu 520					525			
	530					535	Glu				540				
545					550		Lys			555					560
				565			Asn		570					575	_
			580				Thr	585					590	_	
		595					Phe 600					605			_
	610					615	Glu -				620			_	_
625					630		Lys			635					640
				645			Tyr		650					655	
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		675					Leu 680					685			_
	690					695	Lys				700			_	
705					710		Glu			715					720
				725			Ser Ser		730					735	
			740				Ile	745					750		
		755					760 Asn					765		_	
vai	770	מעב	mu	AIU	Arg	775	ASII	110	Aia	Giu	780	vai	цуъ	1111	Giu
	)> 54 .> 13														
<212	2> PF		rilis	5											
		_	,												
	)> 54 Leu		Lys	Gly 5	Asp	Asp	Phe	Val		Thr	Ile	Tyr	Lys		Gly
	Lys	Arg	Phe		Gln	Ser	Leu	Leu	10 Asn	His	Ala	Ala	Arg	15 Glu	Phe

105

110

100

Cys Gln Leu Ser Ala Phe Leu Val Ser Tyr Val Ser Arg Arg Ser 115 120 Asn Gln Ala 130 <210> 5452 <211> 383 <212> PRT <213> B.fragilis <400> 5452 Ile Ile Ile Lys Met Asn Arg His Tyr Leu Ile Thr Leu Thr Pro Met 10 Asp Trp Phe Phe Phe Gly Gly Glu Arg Thr Leu Asp Asp Gly Lys Ser 25 Ala Asp Tyr Ile Ser His Ser Asn Lys Phe Pro Gln Gln Ser Ala Leu 40 Leu Gly Met Ile Arg Tyr Gln Leu Leu Lys Gln His Asn Leu Leu Ser 55 Gln Phe Pro Tyr Thr Glu Asn Lys Pro Thr Glu Lys Glu Ile Met Lys 70 75 Ala Leu Ile Gly Glu Gln Ser Phe Arg Met Thr Glu Arg Lys Ala Lys 85 90 Ser Leu Gly Leu Gly Val Ile Lys Gln Ile Ser Pro Leu Met Leu Ile 100 105 Glu Cys Lys Asp Asp Thr Ser Ser Arg Ser Ile Tyr Phe Pro Leu Pro 120 Leu Asp Asp Gly Tyr Lys Val Ser Phe Asn Glu Thr Ser Asn Glu Asp 135 140 Lys Val Phe Tyr Asn Gly Ile Glu Cys Pro Ile Pro Asn Val Tyr Pro 150 155 Ala Ser Glu Glu Gln Asp Ser Gly Asn Gln Lys Arg Lys Phe Phe Asp 165 170 His Lys Thr Tyr Asn Asn Tyr Leu Phe Trp Cys Thr Gln Gly Asn Asn 180 185 Gln Ile Lys Lys Leu Leu Ser Asp Glu Ile Trp Ile Ser Lys Met Gln 200 Ile Gly Ile Thr Lys His Val Glu Glu Gly Glu Asp Asn Asp Lys Ser 215 220 Phe Tyr Lys Gln Glu Phe Leu Gln Leu Lys Lys Ser Phe Ile Tyr Ala 230 235 Phe Tyr Ile Thr Leu Ser Gly Glu Ser Glu Leu Ser Ser Asp Ile Ile 245 250 Gln Leu Gly Gly Gln Arg Ser Val Phe Arg Met Glu Val Glu Ser Ile 260 265 Glu Glu Asn Ser Asp Ile Gln Glu Lys Tyr Gln Thr Ala Ala Gln Phe 280 Leu Thr Gln Ser Asp Arg Leu Leu Ile Leu Ser Pro Thr Tyr Val Asp 295 300 Asn Leu Lys Glu Leu Ser Ala Leu Cys Asn Phe Met Trp Ser Asp Ser 310 315 Ile Val Phe Arg Asn Ile Gln Thr Thr Asn Ala Ser Asn Phe Tyr Gly 325 330 Lys Pro Ile Lys Ser Ser Ser Lys Tyr His Phe Leu Lys Pro Gly Ser 340 345 Val Leu Tyr Phe Lys Gln Gly Lys Arg Lys Glu Val Glu Lys Leu Leu 360 Met Asp Tyr Thr Tyr Leu Arg Leu Ser Gly Tyr Asn Ile Tyr Ile 375

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     Phe Met Gln Lys Asp Val Ile Tyr Gln Met Phe Trp Gln Gln Tyr Lys
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     Glu Ile Arg Glu Ile Tyr Leu Phe Thr Arg Gly Thr Ala Ser Pro Ser
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     Pro Thr Ala Arg Ile Tyr Leu His Ala Leu Val Gly
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    Gly Leu Thr Asn Gly Arg Val Ala Gln Leu Asn Arg Val Ala Asp Tyr
O
Ţ
    Gly Ser Ala Gly Tyr Arg Phe Glu Ser Cys Arg Gly His Ser Lys Lys
Į.
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Ile Thr Ile Asn Gly Arg Val Ala Gln Leu Asn Arg Val Ala Asp Tyr
                                40
    Gly Ser Ala Gly Tyr Arg Phe Glu Ser Cys Arg Asp His Lys Asn Leu
                            55
    His Asn Gln Ile Met Glu Val Phe Cys Phe Pro Cys Ile Ile Ser Phe
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    Ile Gly Ser Tyr Leu Asn Ser Glu Gly Phe Leu Phe Leu Ile Gly Ser
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    Leu Tyr
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    Ile Leu Lys Lys Ile Phe Met Asn Tyr Lys Lys Ile Ile Cys Leu
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    Leu Val Leu Phe Thr Ile Val Val Val Asn Val Leu Asn Val Val
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    Lys Ser Asp Asp Ala Glu Thr Leu Thr Leu Ser Gly Ile Glu Ala Val
    Ala Ala Thr Tyr Glu Asn Ser Pro Gly Asn Tyr Thr Gly Ala His Asn
   Gln Tyr Cys Thr Ser Pro Lys Asn Ala Thr Gly Cys Val Ser Asp Pro
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   Asp Pro Thr Arg Thr Cys Ser Tyr Ser Ile Phe Cys Lys
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<213> B.fragilis

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2262

<210> 5457

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<400> 5457

Ser Met Arg Lys Ile Lys Val Gly Ile Ile Gln Gln Ala Asn Thr Ser 1 5 10 15

Asp Ile Arg Ile Asn Leu Met Asn Leu Ala Lys Ser Ile Glu Ala Cys 20 25 30

Ala Ala Asn Gly Ala His Leu Val Val Leu Gln Glu Leu His Asn Ser 35 40 45

Leu Tyr Phe Cys Gln Thr Glu Asn Thr Asp Leu Phe Glu Leu Ala Glu 50 55 60

Pro Ile Pro Gly Pro Ser Thr Gly Phe Tyr Ser Glu Leu Ala Ala Ala 65 70 75 80

Asn Arg Ile Val Leu Val Thr Ser Leu Phe Glu Lys Arg Ala Pro Gly 85 90 95

Leu Tyr His Asn Thr Ala Val Val Phe Asp Arg Asp Gly Ser Ile Ala
100 105 110

Gly Lys Tyr Arg Lys Met His Ile Pro Asp Asp Pro Ala Tyr Tyr Glu 115 120 125

Lys Phe Tyr Phe Thr Pro Gly Asp Ile Gly Phe Glu Pro Ile Gln Thr
130 135 140

Ser Leu Gly Lys Leu Gly Val Leu Val Cys Trp Asp Gln Trp Tyr Pro
145 150 155 160

Glu Ala Ala Arg Leu Met Ala Leu Lys Gly Ala Glu Ile Leu Ile Tyr 165 170 175

Pro Thr Ala Ile Gly Trp Glu Ser Thr Asp Thr Asp Asp Glu Lys Lys
180 185 190

Arg Gln Leu Asn Ala Trp Ile Ile Ser Gln Arg Ala His Ala Val Ala 195 200 205

Asn Gly Leu Pro Val Ile Ser Val Asn Arg Val Gly His Glu Pro Asp 210 215 220

Pro Ser Gly Gln Thr Asn Gly Ile Leu Phe Trp Gly Asn Ser Phe Val 225 230 235 240

Ala Gly Pro Gln Gly Glu Tyr Leu Ala Gln Ala Gly Asn Asp Arg Ser  $245 \hspace{1.5cm} 250 \hspace{1.5cm} 255$ 

Glu Asn Met Ile Val Glu Val Asp Leu Glu Arg Ser Glu Asn Val Arg 260 265 270

Arg Trp Trp Pro Phe Leu Arg Asp Arg Ile Asp Glu Tyr Gly Asn 275 280 285

Leu Thr Lys Arg Phe Ile Asp 290 295

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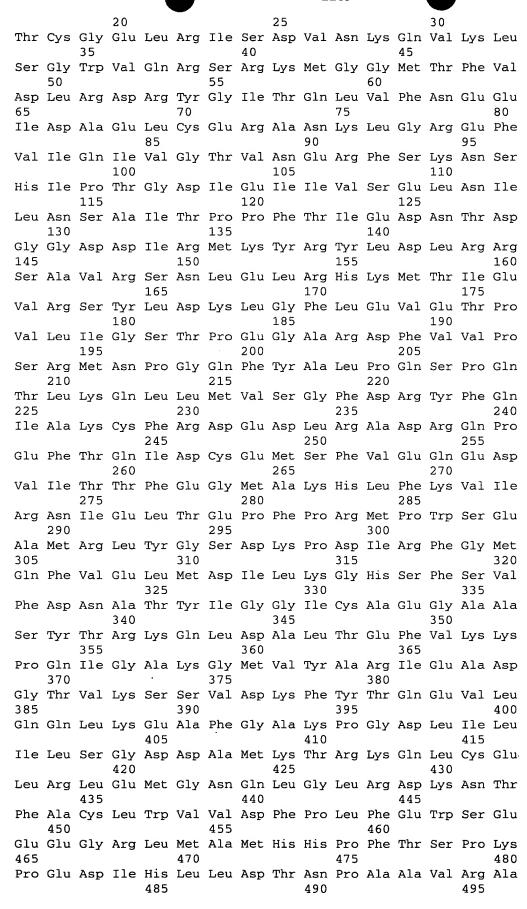
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<213> B.fragilis

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Tyr Phe Asn Lys Asn Ile Asn Asn Ile Leu Asn Met Phe Arg Thr His



Asn Ala Tyr Asp Met Val Ile Asn Gly Val Glu Val Gly Gly Ser 505 Ile Arg Ile His Asp Ser Gln Leu Gln Asn Lys Met Phe Glu Leu Leu 520 Gly Phe Thr Pro Glu Arg Ala Gln Glu Gln Phe Gly Phe Leu Met Asn 535 Ala Phe Lys Phe Gly Ala Pro Pro His Gly Gly Leu Ala Tyr Gly Leu 555 550 Asp Arg Trp Val Ser Leu Phe Ala Gly Leu Asp Ser Ile Arg Asp Cys 565 570 Ile Ala Phe Pro Lys Asn Asn Ser Gly Arg Asp Val Met Leu Asp Ala 585 Pro Ala Ala Leu Asp Pro Ser Gln Leu Glu Glu Leu Asn Leu Ile Val 595 600 605 Asp Ile Lys Glu 610

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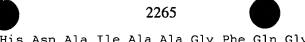
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<213> B.fragilis

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Arg Asp Leu Met Gln Gly Asn Pro Lys Leu Lys Glu Leu Gly Phe Lys
275
280
285



Glu Glu Ala Leu Gly His Asn Ala Ile Ala Ala Gly Phe Gln Gly Gln 300 295 Arg Gln Trp Thr Asp Phe Tyr Pro Asn Gly Asp Phe Ser Glu Ala Leu 315 310 Leu Asn Thr Ser Phe Asp Trp Asn Gly Ile Arg Glu Ala Phe Val Val 330 Ala Thr Glu Asn Asp Ala Cys Asn Gly Val Ala Met Leu Phe Gly His 345 Leu Leu Thr Asn Arg Ala Gln Ile Phe Ser Asp Val Arg Thr Tyr Trp 360 Ser Pro Glu Ala Val Lys Arg Val Thr Gly Lys Glu Leu Thr Gly Met 375 Ala Ala Asn Gly Ile Ile His Leu Ile Asn Ser Gly Ala Thr Thr Leu 390 395 Asp Gly Thr Gly Gln Gln Thr Asn Ala Asn Gly Leu Asn His Gly

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Leu Lys Thr Ala Ile Arg Asn Leu Leu Lys Tyr Lys Thr His Ser Ile
20 25 30

Ile Ser Ala Ile Cys Leu Ser Val Gly Met Thr Cys Phe Ser Ile Ile 35 40 45

His Phe Phe Ile Asn Glu Ile Asp Gly Ala Ser Arg Asn Met Pro Asn 50 55 60

Phe Glu Gln Arg Ile Ser Ile Arg Met Ile Asn Ser Asn His Glu Val 65 70 75 80

Gly Gly Trp Gly Trp Ser Leu Asn Ser Ser Glu Ile Arg Thr Leu Thr

85 90 95

Glu His Pro Ile Pro Gly Ile Lys Gln Ile Cys Phe His Ser Phe Gln

Glu His Pro Ile Pro Gly Ile Lys Gln Ile Cys Phe His Ser Phe Gln
100 105 110

Arg Glu Asp Glu Val Val Phe Ile Asn Arg Glu Gln Gly Arg Lys Ala 115 120 125

Leu His His Leu Ile Tyr Gly Tyr 130 135

<210> 5461

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<212> PRT

<213> B.fragilis

<400> 5461

Lys Lys Lys Thr Met Asn Trp Lys Leu Val Glu Cys Glu Ile Ala 1 5 10 15

Leu Ile Val Ser Leu Thr Val Ile Glu Cys Val Asn Met Gly Gln Asn
20 25 30

Ser Pro Lys Asp Ile Thr Cys Leu Thr Val Phe Phe Cys Ile Met Ile 35 40 45

Val Leu Leu Pro Leu Ile Gly Val Leu Gln Gln Trp His Leu Ser Cys 50 55 60

Phe Gln Asn Arg Gln Lys Glu Lys Glu Tyr Gln Ala Lys Gln Glu Thr 65 70 75 80
Asp Glu Lys Met Lys Thr Trp Leu Leu Ala Arg Glu Ala Ile Ile Lys

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85
                                     90
                                                         95
 Asp Lys Glu Lys Glu Glu Leu Thr Asn Lys Val Asn Gly Leu Gln Gln
                                 105
 Lys Cys Asp Ser Leu Ile Glu Asn Gln Glu Asn Glu Leu Lys Lys Phe
         115
                             120
 Tyr Leu Ser Ile Leu Ser Ile Ile Gly Thr Lys Asp Asp Leu Lys Ser
                        135
 Ile Glu Glu Asn Phe Lys Lys Met Lys Asp Phe Phe Glu Glu Tyr Lys
                                         155
Lys Ile Thr Lys
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<213> B.fragilis
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Gly Ala Gly Lys Lys Ser Leu Thr Ser Ser His Ile Trp Ile Leu Ile
Leu Ile Ser Phe His Ile Ile Met His Pro Ser Tyr Met Ala Asn Ala
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Phe Pro Thr Thr Pro Lys Glu Val Val Leu Ser Glu Ser Cys Ala Arg
Lys Val Tyr Gly Lys Glu Gln Pro Gly Arg Ala His Tyr
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<212> PRT
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Arg Val Asn Leu Gln Pro Lys Cys Ser Phe Pro Val Arg Leu Ser Glu
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Lys Ile Ser Pro Asn His Leu Val Arg Val Val Ser Tyr Ile Val Asp
                                25
Ala Leu Asp Ile Ser Tyr Leu Leu Ser Ala Tyr Asn Gly Gly Gly Thr
                            40
Asn Ser Tyr His Pro Arg Met Ile Leu Lys Val Leu Phe Tyr Ala Tyr
                        55
Leu Asn Asn Ile Tyr Ser Cys Arg Lys Thr Gln Lys Ala Leu Gln Lys
                    70
                                        75
Asn Ile His Ile Met Trp Leu Ser Gly Asn Ser Thr Ser Asn Phe Arg
                85
Thr Ile Asn Asp Phe Arg Gly Lys Val
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                                   10
Val Gln Lys Glu Arg Leu Phe Leu Ile Leu Ala Leu Met Val Gly Ile
Arg Lys Ile Asp Gln Ser Ser Asp Pro Lys Glu Trp Val Val Lys Ser
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410

405



Gln Tyr	Asn Ile 420	e Ser Val )	Phe Ph	e Pro 425	Thr	Glu	Glu	Ala	Ser 430	Val	Ile
Tyr Ile	e Arg Phe 435	e Arg Asp	Asp Il 44		Phe	Gly	Lys	Ala 445	Lys	Ser	Glu
Ile Glu 450		l Cys Arg	Asn Ty 455	r Val	Pro	Glu	Ser 460	Leu	Pro	Leu	Asp
465		Asp Ile 470				475					480
		Ala Ser 485			490					495	
	500	-		505					510		
	515	l Ala Ile	52	0				525			
530	)	Phe Gly	535				540				
545		Tyr Pro 550				555					560
_		o Ile Ser 565			570					575	
Leu Phe	Ile Let 580	ı Ile Gly )	Leu Le	u Ile 585	Phe	Val	Thr	Thr	Ala 590	Tyr	Lys
Ile Ty	Arg Ile 595	e Met His	Leu As 60		Ala	Glu	Ile	Ile 605	Lys	Asn	Glu

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<211> 297

<212> PRT

<213> B.fragilis

<400> 5468

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Tyr Thr Gln Glu Tyr Ser Gln Asn Gly Lys Ser Val His Pro Gly Trp
                   230
                                       235
Pro Phe Asn Gly Thr Ser Ala Phe Phe Arg Arg Val Leu Arg Gly Gly
                                   250
Ser Trp Gly Gly Thr Ala Lys Gly Cys Arg Val Ser Tyr Ile Asp Tyr
            260
                               265
Asp Val Pro Asn Tyr Arg Asp Glu Tyr Gly Gly Phe Arg Leu Val Leu
                           280
Val Pro Asp Ser Val Gln Thr Ala Asn
                       295
<210> 5469
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Ile Thr Val Cys Thr Ile Ser Arg Ile Phe Ala Gly Arg Ile Arg Ile
                                   10
Tyr Phe Gln Gln Tyr Met Lys Lys Phe Ile Leu Asp Leu Thr Val Thr
            20
                               25
Glu Asn Leu Arg Leu His Thr Asn Tyr Val Leu Leu Lys Leu Thr Ser
Gln Thr Val Leu Pro Asp Met Leu Pro Gly Gln Phe Ala Glu Ile Arg
                       55
                                           60
Ile Asp Gly Ser Pro Thr Thr Phe Leu Arg Arg Pro Ile Ser Ile Asn
                   70
Tyr Val Asp Arg Gln Arg Asn Glu Val Trp Phe Leu Ile Gln Leu Val
               85
                                   90
Gly Asp Gly Thr Lys Arg Leu Ala Gln Val Asn Arg Gly Glu Ile Ile
           100
                               105
Asn Val Val Leu Pro Leu Gly Asn Ser Phe Thr Met Pro Glu Lys Pro
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Ser Asp Lys Leu Leu Val Gly Gly Gly Val Gly Thr Ala Pro Met
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Leu Tyr Leu Gly Glu Gln Leu Ala Lys Asn Gly Ser Lys Pro Thr Phe
                   150
                                       155
Leu Clu Ala Arg Ser Asn Lys Asp Leu Clu Leu Glu Asp Phe
                                   170
Ala Ala Tyr Gly Glu Val Tyr Thr Thr Glu Asp Gly Ser His Gly
                               185
Glu Lys Gly Tyr Val Thr Gln His Ser Ile Leu Asn Lys Ile Lys Phe
                           200
Glu Gln Ile Tyr Thr Cys Gly Pro Lys Pro Met Met Ala Val Ala
                       215
                                           220
Lys Tyr Ala Lys Gly Asn Asp Ile Asn Cys Glu Val Ser Leu Glu Asn
                   230
                                       235
Thr Met Ala Cys Gly Ile Gly Ala Cys Leu Cys Cys Val Glu Asn Thr
               245
                                   250
Thr Glu Gly His Leu Cys Val Cys Lys Glu Gly Pro Val Phe Asn Ile
           260
                              265
Asn Lys Leu Leu Trp Gln Ile
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<210> 5470
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<211> 101

<212> PRT

<213> B.fragilis

Thr Leu Cys Cys Glu Met Val Lys Ala Lys Lys Ile Phe Cys Val Val 10 Ala Tyr Asp Ile Gln Asp Asp Arg Ser Arg Ile Gln Ile Ser Lys Ile 25 Leu Glu Lys Tyr Gly Thr Arg Ile Asn Tyr Ser Val Phe Glu Cys Met Phe Thr Asp Arg Gln Phe Gln Lys Ile Gln Ile Asn Leu Glu Arg Trp Ile Asn Arg Arg Tyr Asp Thr Val Val Tyr Tyr Pro Met Cys Ile Asn 70 Cys Tyr Thr Arg Ile Ile Tyr Gln Pro Ile Arg Lys Lys Ile Ile Lys Thr Val Glu Ile Val

Asp Cys Phe Arg Gln Lys Tyr Gly Phe Leu Phe Lys Tyr Leu Tyr Phe

100

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<400> 5471

Cys Glu Lys Leu Lys Ile Met Arg Ile Asp Ile Ile Thr Val Leu Pro 25 Glu Met Ile Glu Gly Phe Phe Asn Cys Ser Ile Met Lys Arg Ala Gln Asp Lys Gly Leu Ala Glu Ile His Ile His Asn Leu Arg Asp Tyr Thr 55 Glu Asp Lys Tyr Arg Arg Val Asp Asp Tyr Pro Phe Gly Gly Phe Ala Gly Met Val Met Lys Ile Glu Pro Ile Glu Arg Cys Ile Asn Ala Leu 85 90 Lys Ala Glu Arg Asp Tyr Asp Glu Val Ile Phe Thr Thr Pro Asp Gly 100 105 Glu Gln Phe Asp Gln Lys Met Ala Asn Ser Leu Ser Leu Ser Gly Asn 120 125 Leu Ile Ile Leu Cys Gly His Phe Lys Gly Ile Asp Tyr Arg Ile Arg 135 Glu His Leu Ile Thr Lys Glu Ile Ser Ile Gly Asp Tyr Val Leu Thr 150 155 Gly Gly Glu Leu Ala Ala Ala Val Met Ala Asp Ala Ile Val Arg Ile 165 170 Ile Pro Gly Val Ile Ser Asp Glu Gln Ser Ala Leu Ser Asp Ser Phe 185 Gln Asp Asn Leu Leu Ala Ala Pro Val Tyr Thr Arg Pro Ala Glu Tyr 195 200 205 Lys Gly Trp Lys Val Pro Glu Ile Leu Leu Ser Gly His Glu Ala Lys 215 220 Ile Lys Glu Trp Glu Leu Gln Gln Ser Leu Glu Arg Thr Arg Arg Leu 230 235 Arg Pro Asp Leu Leu Glu Asp

<210> 5472 <211> 279

<212> PRT

<213> B.fragilis

245

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<210> 5473 <211> 452 <212> PRT

<213> B.fragilis

<400> 5473

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Ala Gly Leu Gln Ile Gly Leu Thr Asp Ala Glu Thr Thr Gly Ala Leu 120 125 Leu Cys Leu Asp Val Thr Glu Ala Val Leu Asp Glu Ala Ile Ala Ser 135 140 Gly Cys Asn Leu Ile Ile Ser His His Pro Leu Ile Phe Lys Gly Tyr 150 155 Lys Ser Ile Thr Gly Lys Asp Tyr Val Glu Arg Cys Ile Leu Lys Ala 165 170 Ile Lys Asn Asp Ile Val Ile Tyr Ser Ala His Thr Asn Leu Asp Asn 180 185 Val Pro Gly Gly Val Asn Phe Lys Ile Ala Glu Lys Ile Gly Leu Lys 200 205 Asn Val Arg Ile Leu Asp Pro Lys Glu Ser Ser Leu Ile Lys Leu Val 215 220 Thr Phe Val Pro Ser Ala Gln Ala Glu Glu Val Arg Asn Ala Leu Phe 230 235 Thr Ala Gly Cys Gly Cys Ile Gly Asn Tyr Asp Ser Cys Ser Tyr Asn 245 250 Thr Glu Gly Glu Gly Thr Phe Arg Ala Gln Glu Gly Ser His Pro Phe 265 Cys Gly Thr Val Gly Glu Leu His Arg Glu Thr Glu Val Arg Ile Glu 280 Thr Ile Leu Pro Glu Tyr Lys Lys Gly Glu Val Ile Arg Ala Leu Leu 295 300 Ser Lys His Pro Tyr Glu Glu Pro Ala Tyr Asp Leu Tyr Pro Leu His 310 315 Asn Ser Trp Ala Gln Val Gly Ser Gly Ile Val Gly Glu Leu Glu Glu 325 330 Pro Glu Ser Glu Leu Glu Phe Leu Lys Arg Ile Lys Lys Ile Phe Glu 340 345 Val Gly Cys Leu Lys His Asn Lys Leu Thr Gly Arg Leu Ile Gln Lys 360 365 Val Ser Leu Cys Gly Gly Ala Gly Ala Phe Leu Ile Pro Gln Ala Val 375 Arg Ser Gly Ala Asp Val Phe Ile Thr Gly Glu Ile Lys Tyr His Asp 390 395 Tyr Phe Gly Arg Glu Thr Asp Ile Leu Leu Ala Glu Ile Gly His Tyr 405 410 Glu Ser Glu Gln Tyr Thr Lys Glu Ile Phe Tyr Ser Ile Ile Arg Asp 425 Leu Phe Pro Asn Phe Ala Leu Gln Phe Ser Lys Val Asn Thr Asn Pro 435 440 Ile Lys Tyr Leu 450 <210> 5474 <211> 63 <212> PRT <213> B.fragilis <400> 5474 Thr Tyr Asn Gly Glu Glu Gln Cys Glu Glu Leu Cys Phe His Ile Gln Cys Lys Phe Val Lys Gly Asp Met Glu Val Ile Cys Met Asn Ile Ala Leu Asn Tyr Ala Asn Val Ser Arg Ser Lys Met Asn Gln Glu Leu Leu 40 Arg Phe Ile Gly Tyr Ile Ser Phe Asn Cys Val Ser Val Leu Ile 55

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370 375 380

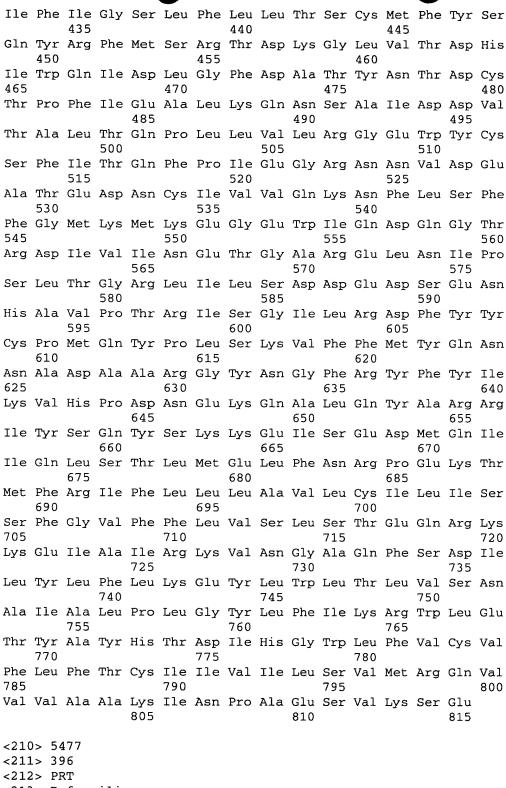
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385 390 395

<211> 815 <212> PRT

<213> B.fragilis

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425



<213> B.fragilis

<400> 5477

Leu Phe Met Gly Leu Leu Gln Glu Lys Leu Ala Lys Tyr Asp Leu Pro 10 Gln Gln Ile Lys Ala Lys Gly Val Tyr Pro Tyr Phe Arg Cys Ile Glu 20

Ser Glu Gln Asn Thr Glu Val Ile Met Ser Gly Arg Lys Val Leu Met Phe Gly Ser Asn Ser Tyr Leu Gly Leu Thr Asn His Pro Lys Val Ile 55 Glu Ala Ala Val Glu Ala Thr Arg Lys Tyr Gly Thr Gly Cys Ala Gly 75 Ser Arg Phe Leu Asn Gly Thr Leu Asp Leu His Leu Gln Leu Glu Lys 90 Glu Leu Ala Glu Phe Val Gly Lys Glu Asp Ala Ile Ile Tyr Ser Thr 100 105 Gly Phe Gln Val Asn Leu Gly Val Val Ser Cys Val Thr Gly Arg Glu 120 125 Asp Tyr Val Ile Cys Asp Glu Leu Asp His Ala Ser Ile Val Glu Gly 135 140 Arg Arg Leu Ser Phe Ser Thr Ile Leu Lys Phe Lys His Asn Asp Met 150 155 Glu Ser Leu Glu Lys Glu Leu Gln Lys Cys Arg Pro Asp Ala Val Lys 165 170 Leu Ile Val Val Asp Gly Val Phe Ser Met Glu Gly Asp Ile Ala Asn 185 Leu Pro Glu Ile Val Arg Leu Ser Lys Lys Tyr Asp Ala Asn Ile Met Val Asp Glu Ala His Gly Leu Gly Val Leu Gly Asn His Gly Arg Gly 215 220 Thr Cys Asp His Phe Gly Leu Thr Lys Glu Val Asp Leu Ile Met Gly 230 235 Thr Phe Ser Lys Ser Leu Ala Ala Ile Gly Gly Phe Ile Ala Ala Asp 245 250 Glu Ser Ile Ile Asn Tyr Leu Arg His Asn Ser Arg Ser Tyr Ile Phe 265 Ser Ala Ser Asn Thr Pro Ala Ala Thr Ala Ala Ala Arg Ala Ala Leu 280 Gln Ile Met Lys Asn Glu Pro Glu Arg Ile Glu His Leu Trp Asp Ile 295 Thr Asn Tyr Ser Leu Lys Cys Phe Arg Glu Leu Gly Phe Glu Ile Gly 310 315 His Thr Ser Thr Pro Ile Ile Pro Leu Tyr Val Arg Asp Met Glu Lys 325 330 Thr Phe Met Val Thr Lys Met Leu Phe Asp Glu Gly Val Phe Val Asn 345 Pro Val Val Pro Pro Ala Cys Ser Pro Asn Asp Thr Leu Ile Arg Phe 360 Ser Leu Met Ala Thr His Ser Lys Glu Gln Ile Asp Phe Ala Ile Gly 375 Lys Leu Val Lys Cys Phe Lys Ala Leu Asp Leu Leu 390 <210> 5478 <211> 189 <212> PRT <213> B.fragilis <400> 5478

Phe Val Phe Met Arg Lys Ser Asn Asp Ile Ile Phe Tyr Ser Leu Leu Ala Leu Cys Leu Phe Thr Asn Cys Leu Phe Ile Gly Tyr Tyr Tyr Tyr 25 Gln Gln Asn Arg Glu Val Leu Leu Gly Gln Glu Leu Glu His Gln Lys

Lys Gln Asn Tyr Glu Leu Ile Val Asn Gln Ile Glu Ser Gly Ile Ile 55 Pro His Val Ile Ser Asp Lys Lys Glu Phe Ala Gly Tyr Phe Val Leu 75 Val Phe Pro Asn Gly Ile Cys Asp Val Cys Asn Lys Trp Leu Phe Lys Gln Ile Ser Glu Leu Ser Ser Thr Ser Asp Leu Val Val Val Pro 100 105 Asp Lys Leu Lys Lys Asn Met Glu Ile Tyr Asn Thr Val Tyr Lys Leu 120 Lys Leu Ser Ser Ile Phe Cys Ser Glu Lys Tyr Ala Met Pro Gln Glu 135 140 Glu Phe Lys Asp Met Thr Tyr Ile Phe Tyr Cys Ser Lys Thr Gly Thr 150 155 Val Leu Tyr Pro Leu Ala Leu His His Lys Asn Ile Asp Leu Asp Leu 165 170 Tyr Phe Lys Leu Val Lys Ser Ile Asp Leu Asp Phe Leu 180

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<213> B.fragilis

260

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<210> 5480 <211> 464 <212> PRT <213> B.fragilis

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2280

Thr Leu Ser Phe Tyr Asp Phe Asp Arg Ile Met Gln Leu Lys Lys 420 425 Cys Lys Lys Ser Val Gly Glu Lys Trp Met Val Lys Leu Asp Asp Met 440 Leu Asp Glu Asn Ser Asn Asp Ile Ile Val Cys Phe Tyr Glu Lys Lys 455

<210> 5481

<211> 471

<212> PRT

<213> B.fragilis

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Gly Ala Ser Lys Ser Asp Trp Leu Pro Gln Val Phe Leu Lys Gly Ser 310 315 Val Gly Tyr Ala Ala Lys Asp Leu Lys Asp Leu Thr His His Lys Ser 330 Met Thr Tyr Glu Ile Ala Pro Ala Leu Ser Trp Thr Leu Phe Lys Gly 345

Glu Pro Ile Gly Val Gly Leu Pro Ala Asp Leu Leu Arg Arg Pro 280 Asp Ile Arg Ser Ala Glu Arg Ser Val Asn Ala Gln Ala Ala Leu Val

300

295

Thr Gln Leu Val Asn Ala Thr Lys Leu Ala Lys Ala Gln Leu Asp Glu 360 355

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2281
Ala Ile Asn Gln Phe Asn Gln Thr Val Leu Thr Ala Val Gln Glu Thr
                                           380
                       375
Asp Asn Ala Met Asn Ala Tyr Arg Asn Ser Ile Lys Gln Ile Val Ala
                                       395
Leu Arg Glu Val Arg Asn Gln Gly Gln Glu Thr Leu Thr Leu Ser Leu
                                    410
                405
Glu Leu Tyr Lys Gln Gly Leu Thr Pro Phe Gln Asn Val Leu Asp Ala
                                425
Gln Arg Ser Leu Leu Ser Tyr Glu Asn Gln Leu Val Gln Ala Arg Gly
                          440
Tyr Ser Leu Leu Gln Leu Ile Ala Met Tyr Gln Ala Leu Gly Gly
                       455
Trp Ser Gly Asn Leu Asn Asn
465
                   470
<210> 5482
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Asn Asn Ile Met Ala His Arg Leu Asn Thr Asn Lys Gln Phe Met Val
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Gly Asn Gly Ile Leu Ala Phe Ala Val Ile Phe Val Val Ile Phe 25 Val Tyr Met Ser Leu Arg Leu Gln Arg Glu Lys Glu Ala Asn Arg His 40 Phe Ser Glu Thr Tyr Ser Ile Gln Leu Thr Lys Gly Phe Val Gly Asp 55 Ser Ile Ser Leu Phe Val Asn Asp Ser Leu Ile Met Asn Lys Gln Ile 70 75 Lys Glu Glu Pro Thr Ala Ile Glu Val Glu Arg Phe Ala Glu Gln Ser 85 90 Ala Leu Met Ile Val Asn Asn Gln Thr Glu Thr Val Ala Ala Phe Asp 105

Leu Ser Glu Lys Gly Gly Thr Tyr Arg Phe Glu Lys Asp Ile Asp Gly 120

Ile Lys Gln Leu Pro Gln Lys 130

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<400> 5483

Lys Leu Ile Ile Trp Leu Ser Val Met Gly Cys Asn Thr Ile Val Ala Gly Trp Ile Met Ile Leu Lys Val Ile Arg Phe Cys Arg Ile Phe Arg 25 Ile Met Thr Leu Tyr Lys Ile Asn Asn Val Asn Asp Ser Phe Arg His 40 Leu Leu Ser Ser Phe Gln Glu Val Asn Ile Val Asn Ala Arg Ser 55

<210> 5484 <211> 152 <212> PRT <213> B.fragilis Cys Tyr Ser Ile Leu Phe Ile Ile Ser Val Ile Lys Ile Val Ile Cys

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     Phe Ile His Tyr Lys Asn Asn Asp Thr Phe Ala Glu Ile Asn Cys Glu
    Lys Arg Met Val Met Ser Trp Gly Lys Thr Ile Leu Gly Cys Leu Ile
                                 40
     Gly Gly Tyr Ala Leu Leu Gly Leu Leu Gly Gly Asn Tyr Ala Tyr Glu
    Gln Glu Val Lys Ala Leu His Val Tyr Ala Asp Ser Val Phe His Glu
                                             75
                        70
     Ala Phe His Val Glu Leu Gln Lys Arg Gly Met Asp Gln Val Glu Ser
                                         90
     Trp Arg Tyr Gly Cys Glu Asp Ser Phe Val Ser Ser Val Asp Thr Ala
                                    105
                100
     Phe Lys Lys Val Thr Ile Gln Asp Glu Tyr Gly Thr Tyr Ser Phe Arg
                                120
                                                    125
     Val Asp Ala Met Lys Ile Arg Lys Asn Ile Val Ser Ser Pro Gly Glu
                             135
     Gln Gly Leu His Thr Val Val Val
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LM
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     Ala Met Asn Ile Glu Glu Phe Arg Glu Tyr Cys Leu Ser Phe Lys Gly
13
     Val His Asp Arg Met Pro Phe Lys Lys Ala Thr Ser Glu Tyr Asp Arg
                                     25
=
13
     Asp Leu Leu Val Phe Tyr Val Met Asp Lys Trp Phe Cys Phe Val Asn
     Ile Asp Ala Phe Asp Phe Cys Asn Ile Lys Cys Asn Ala Gly Gln Ile
                             55
==
     Glu Asp Leu Leu Asp Lys Tyr Glu Gly Val Gln Pro Gly Tyr His Met
                         70
     Asn Lys Lys His Trp Ile Ser Val Tyr Phe Asp Lys Asp Val Pro Asp
                                         90
                     85
     Lys Met Ile Lys Asp Leu Val Lys Gln Ser Tyr Glu Ile Val Val Ser
                                     105
     Ser Leu Ala Arg Arg Glu Arg Glu Ile Leu Gln Ala Met
                                 120
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     Ile Thr Thr Ile Thr Ile Thr Asn Asp Met Lys Asn Thr His Val Leu
     Leu Ile Lys Phe Lys Asn Lys Ile Ser Asp Asp Glu Val Gln Phe Phe
     Arg Ser Ser Ile Ile Gln Lys Leu Gly Asp Gln Pro Asp Ile Leu Tyr
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<400> 5484

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<210> 5487 <211> 383 <212> PRT

<213> B.fragilis

Thr Ile Tyr Lys Asp Asn Val Thr Gln Ala Glu Ala Gln Leu Lys Thr
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Ala Leu Ala Gln Leu Glu Tyr Ala Arg Asn Asn Tyr Ser Arg Met Lys
115 120 125

Glu Ala Leu Lys Ser Asp Ala Val Ser Arg Ile Gln Val Leu Gln Ala
130 135 140

130 135 140
Glu Ser Asn Val Ala Glu Ala Thr Ala Ala Val Ser Asn Ala Glu Ala

145 150 155 160
Thr Leu Asn Thr Ala His Thr Asn Leu Gly Tyr Cys Tyr Ile Arg Ala
165 170 175

Pro Phe Asn Gly Thr Val Ser Arg Ser Leu Tyr Asp Val Gly Ser Tyr 180 185 190

Ile Ser Gly Ala Ala Gln Pro Val Thr Leu Ala Thr Ile Tyr Lys Asp

195 200 205
Asp Arg Met Tyr Thr Tyr Phe Asn Val Ala Asp Asn Gln Trp Leu Ser

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215 220 Met Leu Leu Ser Gln Asn Gly Lys Glu Lys Glu Leu Pro Lys Asn Val 235 230 Ile Val Arg Leu Gly Glu Asn Gly Thr Gln Asn Tyr Pro Ala Thr Leu 250 245 Asp Tyr Leu Ser Pro Asn Val Asp Leu Asn Thr Gly Thr Leu Asn Val 260 265 Arg Ala Asn Leu Asp Asn Pro Lys Gly Ile Leu Lys Ser Gly Leu Tyr 280 Val Ser Ile Thr Leu Pro Tyr Ala Glu Ala Lys Gln Ala Val Leu Val 295 Pro Glu Ala Ser Ile Gly Thr Asp Gln Leu Gly Lys Tyr Leu Tyr Ile 310 315 Val Asn Asp Ser Asn Ile Val Arg Tyr Arg His Ile Glu Pro Gly Gln 325 330 Leu Val Asn Asp Thr Leu Arg Gln Ile Lys Ser Gly Leu Ser Pro Lys 345 340 Glu Gln Tyr Val Thr Thr Ala Leu Met Lys Val Arg Asp Gly Met Lys 360 Val Lys Pro Val Ser Val Asn His Glu Ser Pro Thr Ser Asn Arg 370 375

<210> 5488 <211> 412 <212> PRT

<213> B.fragilis

<400> 5488

 His Ile Cys Ile Cys Ile Ile Glu Cys Tyr Ile His Ala Asn Asp Phe His Ile

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 Thr Phe Tyr Lys Phe Ala Leu Asn Met Lys Thr Gln Phe Phe Thr Leu
 20
 25
 30

 Phe Phe Thr Ile Ile Cys Leu Ser Leu Gln Ala Gln Gln Pro Cys Ile
 35
 40
 45

 Ile Glu Gly Asn Ile Asn Gly Ile Pro Asp Gly Thr Val Ile Ser Met

50 55 60

Met Arg Gln Gln Gly Thr Gly Met Lys Arg Ile Ala Asn Asp Thr Ile
65 70 75 80

Asp Asn Gly Lys Phe Lys Phe Ile Ile His Thr Leu Asn Asn Gln Thr

85

90

95

Glu Ala Leu Arg Ile Val Ser Lys Gly Glu Gly Phe Pro Asn Thr Trp
100 105 110

Leu Asp Val Tyr Ala Ser Pro Gly Glu Thr Val Ser Ile Ile Gly Ser 115 120 125

Asp Lys Leu Leu Arg Thr Trp Asn Ile Val Ser Asn Ile Lys Glu Gln 130 135 140

Gln Glu Glu Asn Gln Tyr Thr Asn Glu Gly Phe Arg Asn Leu Thr Asp 145 150 155 160

Gln Arg Gln Arg Leu Gln Ala Leu Ser Ser Asp Met Trp Lys Lys Ile 165 170 175

Ala Ile Ser Asp Ser Pro Lys Glu Lys Ile Gln Met Thr Asp Ser Ile 180 185 190

Gln Asn Ile Leu Tyr Pro Gln Leu Asp Ser Leu Glu Leu Leu Leu Ser 195 200 205

Lys Glu Glu Ile Asn Leu Met Lys Asn Leu Pro Val Thr Ser Ile Trp 210 215 220

Leu Asp His Leu Glu Ala Leu Ser Arg Gln Ser Val Tyr Leu Lys Gly 225 230 235 240

Phe Pro Ile Ser Glu Ala Gln Val Leu Tyr Gln Gln Leu Thr Ser Thr

245 250 255 Gln Arg Asn Ser Gln Ile Gly Lys Lys Ile Glu Ala Cys Leu Thr Pro 265 Thr Lys Ala Lys Ile Gly Asp Asp Met Pro Asp Thr Glu Leu Ser Asn 280 285 Ile Asp Gly Asn His His Arg Leu Ser Asp Tyr Lys Gly Lys Tyr Leu 295 Leu Leu Asp Phe Trp Ser Arg Ser Cys Gly His Cys Ile Glu Ser Leu 310 315 Pro Glu Met Glu Ile Leu Ser Asp Met Trp Lys Glu Lys Val Thr Phe 330 Ile Gly Ile Asn Ile Asp Asp Glu Lys Ser Trp Lys Glu Phe Ser Gln 340 345 Arg Lys Asn Ile Lys Trp Ile Asp Leu Asn Asp Pro Lys Gly Ala Phe 360 365 Gly Leu Tyr Ile Arg Tyr Lys Ala Asn Gly Thr Pro Phe Tyr Val Leu 375 380 Val Thr Pro Asp Gly Lys Ile Thr Asp Ile Trp Tyr Gly Tyr Asn Lys 390 395 Asp Ser Leu Ser Glu Arg Leu Lys Gln Gly Ile Lys 405

<210> 5489 <211> 211 <212> PRT <213> B.fragilis

<400> 5489

Ile Tyr Cys Met Lys Gln Leu Ile Asp Leu Glu Asn Trp Asn Arg Lys Glu His Phe Lys Phe Phe Ser Ala Phe Asp Asp Pro Phe Phe Gly Ile 20 25 Thr Thr Leu Val Asp Phe Thr Asn Thr Tyr His Gln Ser Lys Asp Glu 40 Lys Lys Ser Phe Phe Leu Tyr Ser Val His Phe Leu Leu Gln Cys Val 55 Asn Glu Val Glu Ala Phe Lys Leu Arg Ile Glu Gly Glu Gln Val Val 70 Lys Tyr Asp Phe Ile His Leu Ser Pro Thr Ile Gly Arg Glu Asp Gly 90 Thr Phe Gly Phe Gly Phe Phe Glu Tyr Asp Ala Asp Leu Glu Val Phe 105 Ile Gln Asn Ala Glu Lys Glu Ile Glu Arg Val Lys Asn Ser Thr Gly 120 125 Leu Ser Phe Ser Glu Asn Ile Gly Arg Leu Asp Leu Ile Arg Tyr Ser 135 140 Ala Leu Pro Trp Phe Ala Phe Ser Glu Met Lys His Ala Val Ser Phe 150 155 Gly Arg Gly Asp Ser Val Pro Arg Ile Ser Thr Gly Lys Leu Ile Lys 165 170 Glu Asn Gly Val Tyr Leu Leu Pro Ile Ser Ile Ser Gly His His Ala 185 Leu Met Asp Gly Arg Asn Val Ala Glu Leu Ile Glu Lys Leu Glu Thr 195 200 205 Thr Lys Lys 210

<210> 5490 <211> 143 <212> PRT <213> B.fragilis

<400> 5490

Thr Val Leu Ile Leu Ile Ile Leu Glu Tyr Ile Tyr Ile Leu Met Leu Trp Ser Val Leu Cys Gln Arg Gly Arg Ser Leu Asn Pro Tyr Tyr Thr Gly Ile His Leu His Lys Asp Glu Asn Gly Tyr Tyr Ile Lys Ser Val 40 Thr Arg Leu Asn Pro Tyr Tyr Thr Gly Ile His Leu His Leu Asn Arg Ala Ala Lys Lys Leu Asn Cys Phe Cys Leu Asn Pro Tyr Tyr Thr Gly 70 75 Ile His Leu His Glu Lys Glu Lys Asp Glu Val Gly Glu Met Thr Ser Leu Asn Pro Tyr Tyr Thr Gly Ile His Leu His Cys Leu Cys Ser Ile 105 100 Arg Glu Glu Gly Tyr Arg Arg Leu Asn Pro Tyr Tyr Thr Gly Ile His 120

Leu His Ile Thr Cys Leu Gly Ser Tyr Leu Ser Cys Ile Val Ser

135

<210> 5491 <211> 94 <212> PRT

<213> B.fragilis

<400> 5491

Gln Val Leu Ile Leu Ile Ile Leu Glu Tyr Ile Tyr Ile Val Cys Val 10 Pro Ser Val Lys Lys Ala Ile Gly Val Leu Ile Leu Ile Leu Glu 25 Tyr Ile Tyr Ile Leu Leu Val Trp Ala Val Ile Cys Leu Val Ser Cys 40 Leu Asn Pro Tyr Tyr Thr Gly Ile His Leu His Val Thr Ile Asn Asn 55 Gln Asp Met Gly Leu Gly Val Leu Ile Leu Ile Ile Leu Glu Tyr Ile 70 Tyr Met Asn Ser Asp Ile Leu Tyr Arg Thr Pro His Val Ser

<210> 5492 <211> 139 <212> PRT <213> B.fragilis

<400> 5492

Lys Leu Glu Met Lys Ile Ser Lys Lys Gln Ile Glu Tyr Ala Ile Glu 10 Ala Leu Arg Ala Asn Asn Ile Ile Thr Asn Asp Asn Gln Tyr Pro Lys 25 Val Phe Lys Gly Tyr Ile Ser Ser Phe Gly Ala Ala Val Ile Gln Ser Gly Leu Ile Pro Ala Ile Ile Phe Phe Glu Asn Glu Asp Asn Asp Ala Asn Ala Asp Arg His Lys Ile Ile Gly Val Leu Lys Asp Ile Ile Asn Ala Met Arg Gln Gln Tyr Thr Val Thr Asp Ala Thr Ile Leu Val Ser

2287 90 95 85 Ser Gln Ile Pro Ala Asn Tyr Ser Met Ala Gln Tyr Ile Ile Glu His 105 Gly Asn Thr Asp Gln Leu Leu Lys Glu Ile Thr Glu Ala Ala Val Ala 120 Met Lys Leu Ala Leu Arg Met Tyr Lys Ser Glu 135 <210> 5493 <211> 749 <212> PRT <213> B.fragilis <400> 5493 Asn Glu Glu Ile Asn Ile Ser Met Ile Leu His Tyr Leu Lys Ile Val 10 Phe Arg Gln Met Ala Lys Arg Lys Val Gln Thr Ala Ile Ser Ile Leu Gly Ile Thr Ala Gly Leu Leu Cys Phe Ser Val Cys Asn Tyr Tyr Asn Arg Ile Phe Ser Thr Gly Asn Lys Asp Leu Ala Thr Tyr Glu Asn Gln Ala Glu Ile Cys Ile Lys Glu Arg Ser Tyr Gln Val Asn Ile Pro Ile 75 70 Glu Asp Phe Glu Lys Lys Ile Gly Lys Asp Lys Phe Glu Ala Val Ala 90 Phe Tyr Val Asn Ser Ser Ser Thr Ile Thr Leu Asp Glu Thr Ile Tyr 105 100 Cys Lys Val Asp Lys Thr Glu Cys Asn Ala Asp Tyr Phe Lys Val Phe 125 120 Pro Thr Glu Cys Ile Asp Gly Ser Leu Lys Gln Phe Gly Ile Ser Gly 140 135

Asn Glu Ala Val Val Thr Thr Glu Phe Val Lys Gln Phe Cys Gly Gly 155 150 Val Pro Pro Leu Gly Lys Thr Ile Leu Asn Gln Arg Gly Lys Ile His 170 165 Thr Ile Ile Ala Val Ile Lys Pro Tyr Pro Ala Gly Met Asn Asn Tyr 185 His Ser Ser Tyr Asp Val Phe Leu Pro Leu Pro Glu Asn Ala Ser Phe 200 Gly Ile His Lys Leu Leu Lys Arg Pro Glu Asp Ala Glu His Ile 215 220 Ser Gln Leu Pro Lys Leu Gly Leu Phe Pro Asn His Pro Glu Trp 235 230 Ile Pro Gln Ile Val Leu Asp Ser Gln Thr Glu His Lys Ala Gly Ala 245 250 Glu Leu Trp Val Ala Ile Leu Gly Leu Leu Val Leu Val Gly Met 260 265 Ile Asn Tyr Phe Ser Phe Ser Ile Gly Ala Phe Ala Asn Arg Tyr Lys 280 285 Glu Ile Ser Leu Arg Asn Thr Leu Gly Ser Thr Tyr Trp Gly Leu Phe 295 Ile Leu Leu Phe Leu Glu Gln Ala Val Ile Ile Leu Ile Cys Gly Ile 310 315 Ile Thr Leu Ala Ile Thr Glu Ser Leu Leu Pro Trp Phe Ile Ser Thr 325 330 Phe Ser Asn Glu Ile Gln Arg Asn Leu Tyr Ile Asp Ile His Arg Leu 345 Trp Val Tyr Glu Cys Gln Tyr Ile Gly Gly Leu Leu Ile Ser Leu

365 360 Leu Ile Ser Phe Ile Ser Ser Trp His Ile Ala His Lys Thr Ile Ala 375 Gln Gly Leu Arg Gly Gly Thr Thr Thr Gly Gln Arg His Ile Ile Arg 395 390 Asn Thr Leu Leu Ser Val Gln Leu Leu Phe Ser Phe Leu Phe Ile Val 410 405 Gly Thr Val Gly Ile Arg Met Gln Met Lys Glu Tyr Asp Leu Ser Ala 425 Asn Pro Asn Leu Ser Thr Glu Val Lys Lys Glu Ile Met Val Val Asn 440 Ile Gly Arg Tyr Asp Arg Ile Arg Glu His Gln Pro Glu Leu Ile Asn 455 460 Phe Leu Arg Ser Arg Arg Trp Asn Ala Glu Thr Ala Tyr Thr Asn Arg 475 470 Asp Tyr Ser Gln Glu Tyr Gly Phe Thr Glu Leu Cys Phe Val Ser Asp 490 Asp Tyr Phe Asn Leu Met Asn Ile Lys Cys His His Lys Pro Gly Glu 505 500 Pro Phe Cys Tyr Val Asn Glu Gln Leu Tyr Gln Thr Leu Gln Ala Asp 520 525 Ser Thr Ser Glu Ser Phe Arg Phe Gln Asn Gln Val Tyr Pro Val Lys 535 Gly Leu Val His Ile Gly Pro Asp Ser Pro Ser Ala Lys Gln Leu Ala 555 550 Leu Leu Pro Leu Ser Ala Met Asn Asp Glu Ile Gly Lys Ile Tyr Ile 570 565 Arg Leu Val Pro Asp Ala Pro Arg Lys Glu Val Lys Ala Glu Met Ser 585 Lys Glu Met Asn Gln Tyr Leu Pro Gln Asn Glu Pro Phe Glu Phe Ile 600 Ser Leu Tyr Glu Glu Gln Thr Gly Leu Gly Thr Ile Ser Val Met Trp 620 615 Leu Phe Val Val Cys Ser Ser Ile Cys Leu Val Ile Thr Val Leu Gly 635 630 Val Tyr Gly Ala Ile Ser Ile Asp Thr Ile Arg Lys Gln Lys Glu Val 650 Ala Ile Arg Lys Ile Asn Gly Ala Arg Leu Pro Asp Ile Tyr Trp Leu 665 Phe Ala Lys Asn Tyr Leu Ile Leu Phe Leu Ile Ala Ser Val Val Gly 685 680 Gly Leu Ile Ser Leu Phe Val Met Val Ile Gly Ser Gln His Arg Val 700 695 Ile Leu Phe Asp Tyr Ala Asp Pro Trp Leu Trp Met Gly Pro Leu Met 715 710 Leu Leu Ile Gly Ile Ile Thr Ala Thr Ile Ser Trp Gln Ile Tyr Tyr 730 725 Ile Ala Arg Thr Asn Pro Ala Glu Val Ile Lys Asn Glu 745 740 <210> 5494 <211> 141

<212> PRT

<213> B.fragilis

<400> 5494

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25 Gly Ile Phe Ser Gln Val Thr Leu Ser Cys Glu Gln Arg Arg Lys Glu Ile Ala Ile Arg Lys Val Asn Gly Ala Thr Ile Gly Ser Ile Leu Gln Met Phe Ile Lys Glu Tyr Phe Val Leu Leu Val Ala Ala Leu Ile 75 70 Ala Phe Pro Ala Ser Tyr Gly Met Met Arg Val Trp Ile Glu Ser Tyr Val Arg Gln Thr Ser Thr Pro Phe Trp Ile Tyr Ile Val Leu Phe Ala 105 100 Gly Ile Gly Ile Ile Ile Val Ile Ser Ile Phe Trp Arg Val Trp Asn 120 Ala Ala Lys Gln Asn Pro Ala Glu Val Val Lys Thr Glu 135 <210> 5495 <211> 331 <212> PRT <213> B.fragilis

<400> 5495

Pro Leu Leu Ile Arg Met Lys Ile Thr Phe Gly Gln Gln Thr Thr Lys Val Lys Gln Leu Ala Asp Lys Ile Ser Phe Asp Ile Ser Met Gly Val 25 Tyr Lys Ser Gly Asp Ser Leu Pro Ser Ile Asn Gln Leu Ser Gln Ala 40 Tyr Glu Val Ser Arg Asp Thr Val Phe Lys Ala Phe Leu Asp Leu Lys 55 Glu Arg Gly Ile Ile Asp Ser Thr Pro Gly Lys Gly Tyr Tyr Val Val 75 70 Gly Arg Leu Lys Asn Val Leu Leu Leu Leu Asp Glu Tyr Ser Pro Phe 90 85 Lys Tyr Ala Leu Tyr Asn Ser Phe Val Lys Arg Leu Ser Ile Arg Tyr 105 Lys Val Asp Leu Leu Phe His Gln Tyr Asn Glu Arg Leu Phe Asn Thr 120 115 Ile Ile Arg Glu Ser Leu Gly Arg Tyr Asn Lys Tyr Ile Val Met Asn 140 135 Phe Asp Asn Glu Lys Leu Ser Pro Asn Leu Tyr Lys Ile Asn Pro Ser 155 150 Lys Leu Leu Leu Asp Phe Gly Lys Phe Glu Lys Glu Gly Phe Ser 170 165 Tyr Val Cys Gln Asp Phe Asp Gln Gly Phe Tyr Asn Ala Leu Phe Gln 185 Leu Ala Asp Arg Leu Arg Lys Tyr Gln Lys Leu Val Phe Val Leu Val 200 Asp Asp Ser Met His Pro Arg Ser Ser Arg Asp Phe Phe Glu Arg Phe 215 220 Cys Ala Asp Gln His Leu Gly Cys Glu Val Val Ser Asp Ile Glu Gly 235 230 Leu Gln Val Arg Arg Gly Glu Val Tyr Ile Ala Ile Arg Gln Ile Asp 245 Val Val Ser Ile Ile Lys Lys Ser Arg Val Glu Gly Leu Gln Cys Gly 265 Val Asp Phe Gly Leu Ile Gly Tyr Asn Asp Thr Pro Ala Tyr Glu Val 280 Ile Asp Gln Gly Ile Thr Ala Leu Ser Val Asp Trp Glu Lys Met Gly 290 295 300

Asp Lys Ala Ala Glu Phe Val Leu Gln Gly Lys Thr Ile Gln Asp Tyr 305 310 315

Leu Pro Thr Glu Val Arg Leu Arg Ala Ser Leu 325 320

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<211> 228
<212> PRT
<213> B.fragilis

<400> 5496 Lys Ile Thr Ile Met Ile Lys Thr Ile Asn Leu Gln Lys Ile Phe Lys 10 Thr Glu Glu Val Glu Thr Trp Ala Leu Asn Asn Val Ser Val Glu Val 25 Lys Glu Gly Glu Phe Val Ala Ile Met Gly Pro Ser Gly Cys Gly Lys 40 Ser Thr Leu Leu Asn Ile Leu Gly Leu Leu Asp Asn Pro Thr Gly Gly 55 Glu Tyr Tyr Leu Asn Gly Lys Glu Val Ser Lys Tyr Thr Glu Ser Gln 75 Arg Thr Asn Leu Arg Lys Gly Val Ile Gly Phe Val Phe Gln Ser Phe 90 Asn Leu Ile Asp Glu Leu Asn Val Tyr Glu Asn Ile Glu Leu Pro Leu 100 105

Leu Tyr Met Gly Ile Pro Ala Ser Glu Arg Lys Gln Arg Val Glu Lys 115 120 125 Ala Met Glu Arg Met Ala Ile Thr His Arg Ser Lys His Phe Pro Gln

130

135

140

Gln Leu Ser Gly Gly Gln Gln Gln Arg Val Ala Ile Ala Arg Ala Val

Asp Ser Lys Asn Gly Lys Glu Val Met Gly Leu Leu Ser Glu Leu Asn 180 185 190

Lys Glu Gly Thr Thr Ile Val Met Val Thr His Ser Gln His Asp Ala 195 200 205

Gly Phe Ala Asp Arg Val Ile Asn Leu Phe Asp Gly Gln Val Val Thr 210 215 220 .

Glu Val Thr Ile 225

<210> 5497 <211> 209

<212> PRT

<213> B.fragilis

<400> 5497

Arg Tyr Thr Met Leu Gln Ile Asp Asn Ala Cys Ile Ala Phe Gly Glu

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Asp Ile Leu Phe Cor Clu Phe Cys Met Arg Leu Asp Lys Clu Thr

Asp Ile Leu Phe Ser Glu Phe Cys Met Arg Leu Asn Lys Gly Glu Thr 20 25 30

Ala Cys Ile Ala Gly Gln Ser Gly Arg Gly Lys Thr Ser Leu Leu Asn 35 40 45

Ala Ile Met Gly Phe Val Pro Leu Arg Lys Gly Lys Ile Lys Val Gly 50 55 60

Gly Ile Leu Leu Glu Pro Thr Thr Ile Asp Ala Ile Arg Arg His Ile
65 70 75 80

Ala Trp Ile Pro Gln Glu Leu Ala Leu Pro Ser Glu Trp Val Lys Glu 90 Met Ile Ser Leu Pro Phe Ala Leu Lys Ala Asn Arg His Ile Ser Phe 105 Ser Lys Glu Lys Leu Phe Thr Cys Phe Asp Glu Leu Gly Leu Asp Lys 120 Glu Leu Tyr Gln Lys Arg Val Gly Glu Ile Ser Gly Gly Gln Arg Gln 135 140 Arg Ile Met Ile Ala Val Ala Ala Met Leu Glu Lys Pro Leu Ile Ile 155 150 Val Asp Glu Pro Thr Ser Ala Leu Asp Ala Gly Ser Thr Asp Lys Val 170 165 Leu Ala Phe Phe Arg Asn Gln Ala Glu Lys Gly Thr Ala Ile Leu Ala 185 Val Ser His Asp Arg Thr Phe Ala Tyr Gly Cys Asn Gln Leu Ile Thr 200

Leu

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<212> PRT
<213> B.fragilis
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<400> 5498

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<210> 5499 <211> 62 <212> PRT <213> B.fragilis

165

<400> 5499

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<210> 5500 <211> 686 <212> PRT

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Val Ser Lys Lys Val Glu Ile Ile Thr Lys Ser Tyr Lys Glu Gly Ala 140 135 Gln Ala Val Lys Trp Thr Cys Asp Gly Ser Pro Glu Phe Thr Leu Glu

155 150 Glu Val Glu Lys Ala Asp Arg Gly Thr Asp Ile Val Leu Tyr Ile Asp

175 170 165 Asp Asp Cys Lys Glu Phe Leu Glu Glu Ser Arg Ile Ser Ala Leu Leu 185

Lys Lys Tyr Cys Ser Phe Leu Pro Val Pro Ile Ala Phe Gly Lys Lys 200 195

Lys Glu Trp Lys Asp Gly Lys Gln Val Glu Thr Ala Glu Asp Asn Val 215 220

Ile Asn Asp Thr Ile Pro Leu Trp Thr Lys Lys Pro Ser Glu Leu Ser 235 230

Asp Glu Asp Tyr Lys Lys Phe Tyr Arg Glu Leu Tyr Pro Met Ser Asp 250 245

Glu Pro Leu Phe Trp Ile His Leu Asn Val Asp Tyr Pro Phe His Leu 265 260

Thr Gly Ile Leu Tyr Phe Pro Lys Val Lys Ser Asn Ile Asp Leu Asn 280 285

Lys Asn Lys Ile Gln Leu Tyr Cys Asn Gln Val Tyr Val Thr Asp Ser 295 300

Val Glu Gly Ile Val Pro Asp Phe Leu Thr Leu Leu His Gly Val Leu 310 315

Asp Ser Pro Asp Ile Pro Leu Asn Val Ser Arg Ser Tyr Leu Gln Ser 330 325

Asp Ser Asn Val Lys Lys Ile Ser Thr Tyr Ile Ser Lys Lys Val Ser 345

Asp Arg Leu Gln Ser Ile Phe Lys Asn Asp Arg Ala Gln Phe Glu Glu 360

Lys Trp Asn Asp Leu Lys Ile Phe Ile Asn Tyr Gly Met Leu Thr Gln 375 380

Glu Asp Phe Tyr Asp Lys Ala Gln Lys Phe Ala Leu Phe Thr Asp Thr

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# 513
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395 390 Asp Gly Lys His Tyr Thr Phe Glu Glu Tyr Gln Thr Leu Ile Lys Asp 410 405 Asn Gln Thr Asp Lys Asp Lys Asn Leu Ile Tyr Leu Tyr Ala Asn Asn 425 Lys Asp Glu Gln Phe Ala Tyr Ile Glu Ala Ala Lys Asn Lys Gly Tyr 440 Asn Val Leu Leu Met Asp Gly Gln Leu Asp Val Ala Met Val Ser Met 455 460 Leu Glu Gln Lys Leu Glu Lys Ser Arg Phe Thr Arg Val Asp Ser Asp 475 470 Val Val Asp Asn Leu Ile Val Lys Glu Asp Lys Lys Ser Asp Val Leu 485 490 Glu Ala Ser Lys Gln Glu Ala Leu Ser Ala Ala Phe Lys Ser Gln Leu 505 500 Pro Lys Met Glu Lys Val Glu Phe Asn Val Met Thr Gln Ala Leu Gly 525 520 Glu Asn Gly Ser Pro Val Met Ile Thr Gln Ser Glu Tyr Met Arg Arg 535 Met Lys Glu Met Ala Asn Ile Gln Ala Gly Met Ser Phe Tyr Gly Glu 550 555 Met Pro Asp Met Phe Asn Leu Val Leu Asn Ser Asp His Lys Leu Val 570 565 Lys Glu Val Leu Ala Asp Glu Glu Lys Glu Cys Ser Ala Ala Ile Ala 585 Pro Ile Gln Thr Glu Leu Glu Asp Val Thr Lys Arg Asp Ala Leu 600 Lys Lys Lys Gln Glu Gly Lys Lys Asp Glu Asp Ile Pro Thr Ala Glu 620 615 Lys Asp Glu Leu Asn Asp Leu Asp Lys Lys Trp Asp Glu Leu Lys Gln 635 630 Gln Lys Asp Ser Ile Phe Ala Gly Tyr Ala Gly Lys Asn Lys Val Val 650 645 Arg Gln Leu Ile Asp Leu Ala Leu Leu Gln Asn Asn Met Leu Lys Gly 665 Glu Ala Leu Asn Asn Phe Val Lys Arg Ser Ile Glu Leu Ile 680

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<213> B.fragilis

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Lys Asn Thr Ser Ile Arg Asn Ser Gly Lys Leu Glu Ile Arg Val Ser

2294 120 125 115 Ser Pro Ser Leu Thr 130 <210> 5502 <211> 303 <212> PRT <213> B.fragilis <400> 5502 Arg Leu Leu Ile Leu Met Ile Gln Thr Arg Leu Lys Gly Met Gly .10 Val Ala Leu Ile Thr Pro Phe Lys Glu Asp Glu Ser Val Asp Tyr Asp 25 Ala Leu Met Arg Leu Val Asp Tyr Leu Leu Gln Asn Ala Asp Phe 40 Leu Cys Val Leu Gly Thr Thr Ala Glu Thr Pro Thr Leu Ser Glu Glu 55 60 Glu Lys Lys Lys Ile Lys Lys Met Val Ile Asp Arg Val Asn Gly Arg Ile Pro Ile Leu Leu Gly Val Gly Ser Asn Asn Thr Arg Ala Val Val Glu Thr Leu Lys Asn Asp Asp Phe Thr Gly Val Asp Ala Ile Leu Ser 105 Val Val Pro Tyr Tyr Asn Lys Pro Ser Gln Glu Gly Ile Tyr Gln His 120 Tyr Lys Ala Ile Ala Ser Ala Thr Glu Leu Pro Ile Val Leu Tyr Asn 135 140 Val Pro Gly Arg Thr Gly Val Asn Met Thr Ala Glu Thr Thr Leu Arg 150 155 170 165 185 180

Ile Ala Lys Asp Phe Gln Asn Val Ile Ala Ile Lys Glu Ala Ser Gly Asn Ile Thr Gln Met Asp Asp Ile Ile Lys Asn Lys Pro Ala Asn Phe Asp Val Ile Ser Gly Asp Asp Gly Ile Thr Phe Pro Leu Ile Thr Leu 200 205 Gly Ala Val Gly Val Ile Ser Val Ile Gly Asn Ala Phe Pro Arg Glu 220 215 Phe Ser Arg Met Thr Arg Leu Ala Leu Gln Gly Asp Phe Ala Asn Ala 230 235 Leu Thr Ile His His Lys Phe Thr Glu Leu Phe Asn Leu Leu Phe Val 250 245 Asp Gly Asn Pro Ala Gly Val Lys Ser Met Leu Asn Ala Met Gly Met 265 Ile Glu Asn Lys Leu Arg Leu Pro Leu Val Pro Thr Arg Ile Thr Thr

280

Phe Glu Ala Ile Arg Lys Val Leu Asn Glu Leu Asn Ile Lys Cys

295

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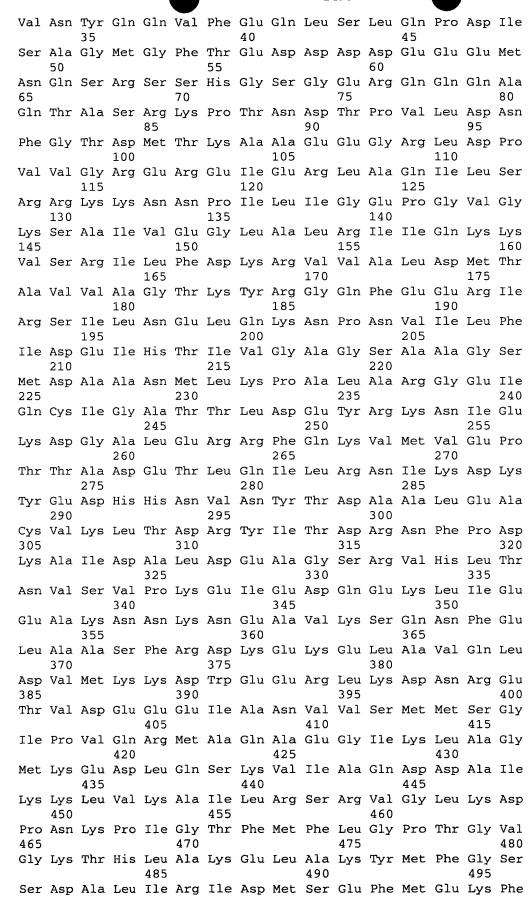
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<213> B.fragilis

400> 5503

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2296 500 505 Thr Val Ser Arg Leu Val Gly Ala Pro Pro Gly Tyr Val Gly Tyr Glu 520 525 Glu Gly Gly Gln Leu Thr Glu Lys Val Arg Arg Lys Pro Tyr Ser Ile 540 535 Val Leu Leu Asp Glu Ile Glu Lys Ala His Pro Asp Val Phe Asn Leu Leu Leu Gln Val Met Asp Glu Gly Arg Leu Thr Asp Ser Tyr Gly Arg 565 570 Met Val Asp Phe Lys Asn Thr Val Ile Ile Met Thr Ser Asn Ile Gly 585 Thr Arg Gln Leu Lys Glu Phe Gly Arg Gly Val Gly Phe Ala Thr Gln 600 Ser Arg Leu Asp Asp Lys Glu Phe Ser Arg Ser Val Ile Gln Lys Ala 615 Leu Asn Lys Ser Phe Ala Pro Glu Phe Ile Asn Arg Val Asp Glu Ile 630 635 Ile Thr Phe Asp Gln Leu Ser Leu Glu Ala Ile Thr Lys Ile Ile Asp 650 Ile Glu Leu Lys Gly Leu Tyr Asn Arg Ile Glu Ser Ile Gly Tyr Lys 665 660 Leu Val Ile Glu Asp Lys Ala Lys Gln Phe Val Ala Ser Lys Gly Tyr 680 Asp Val Gln Tyr Gly Ala Arg Pro Leu Lys Arg Ala Ile Gln Thr Tyr 695 700 Leu Glu Asp Gly Leu Ser Glu Leu Ile Ile Ser Ala Asp Leu Asn Glu 710 715 Gly Asp Thr Ile Thr Val Ser Leu Asn Glu Glu Lys Gly Glu Leu Glu 725 730 Met Lys Asn Glu Ala Lys Thr Ala Glu 740 <210> 5504 <211> 238 <212> PRT <213> B.fragilis <400> 5504 Ser Lys Ser Ser Gly Leu Tyr Trp Asn Arg Gln Thr Tyr Lys His Trp Ile Trp Tyr Asp Asn Ser Lys Leu Ile Gln Lys Arg Pro Lys Met Ile 25 Glu Ser Ile Thr Ser Ile Gly Ile Phe Ile Asp Gly Gly Tyr Phe Thr

Lys Ile Asn Gln Ala Leu Glu Glu Lys Leu Ser Leu Asn Ile Asp Ile 55 Thr Phe Phe Lys Phe Ile Lys Glu Lys Ile Ala Tyr Glu Tyr Asn 70 75 Leu Asn Thr Glu Phe Cys Gln Ile Thr Glu Ser His Tyr Phe Arg Gly 85 90 Arg Tyr Arg Val Asn Asp Ala Asn Asn Lys His Leu Leu Phe Ser Glu 105 Arg Lys Phe Glu Asp Ser Leu Ile Glu Asn Asp Val Ile Phe His Tyr 120 Lys His Leu Arg Glu Ile Gln Lys Glu Gly Glu Ile Asn Val Ile Glu Lys Gly Ile Asp Val Trp Phe Ala Leu Glu Ala Tyr Glu Leu Ser Leu 150 155 Phe Arg Lys Phe Asp Phe Val Ile Leu Ile Thr Gly Asp Ala Asp His

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2297
                                                        175
               165
                                   170
Glu Met Leu Ile Lys Lys Leu Lys Ala Leu Lys Ile His Thr Ile Leu
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Leu Thr Trp Asp Leu Ser Pro Glu Ser Ala Thr Ala Arg Leu Leu Arg
                                                205
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Glu Glu Ala Cys Lys His Ile Glu Leu Ser Glu Ile Ala Ile Glu Asp
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Lys Asp Leu Ile Lys Lys Ile Cys Arg Ser Lys Gln Lys Arg
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Gly Thr Val Leu Gln Val Ser Asp Gly Val Val Arg Ile Tyr Gly Leu
Arg Asn Ala Glu Ala Asn Glu Leu Leu Glu Phe Asp Asn Gly Ile Lys
                       55
Ala Ile Val Met Asn Leu Glu Glu Asp Asn Val Gly Ala Val Leu Leu
Gly Pro Thr Asp Lys Ile Lys Glu Gly Phe Thr Val Lys Arg Thr Lys
                                    90
Arg Ile Ala Ser Ile Arg Val Gly Glu Ser Met Leu Gly Arg Val Ile
                               105
Asp Pro Leu Gly Glu Pro Leu Asp Gly Lys Gly Leu Ile Gly Glu
                           120
                                                125
Leu Tyr Glu Met Pro Leu Glu Arg Lys Ala Pro Gly Val Ile Tyr Arg
                       135
                                            140
Gln Pro Val Asn Gln Pro Leu Gln Thr Gly Leu Lys Ala Val Asp Ala
                                        155
                    150
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Gly Gln Lys Gly Ser Thr Val Ala Ser Ile Val Asn Thr Leu Arg Gln
210

Tyr Gly Ala Met Asp Tyr Thr Ile Val Val Ala Ala Thr Ala Gly Asp
225

230

230

235

240

Pro Ala Ala Leu Gln Tyr Phe Ala Pro Phe Gly Gly Gly Cys His Arg
245 250 250 255

<210> 5506 <211> 265 <212> PRT <213> B.fragilis

<400> 5506

Lys Gly Ala Leu Ser Met Glu Leu Arg Thr Val Asn Val Thr Arg Tyr

1 5 10 15

Ile Met Pro Leu Arg Glu Gly Gly Ser Leu Pro Ala Leu Ala Glu Ala

Asp Asp Ser Phe Lys Tyr Val Val Lys Phe Arg Gly Ala Gly His Gly 40 Thr Lys Ala Leu Ile Ala Glu Leu Ile Gly Gly Glu Val Ala Arg Val Leu Gly Phe Arg Val Pro Glu Leu Val Phe Leu Asn Leu Asp Glu Ala 75 Phe Gly Arg Ser Glu Gly Asp Glu Glu Ile Gln Asp Leu Leu Gln Gly Ser Arg Gly Leu Asn Met Gly Leu His Phe Leu Ser Gly Ala Leu Pro 100 105 Phe Asp Pro Val Val Thr Glu Val Asp Glu Lys Leu Ala Ser Gln Val 120 Val Trp Leu Asp Ala Leu Leu Thr Asn Val Asp Arg Thr Val Lys Asn 135 140 Thr Asn Met Leu Met Trp His Lys Glu Leu Trp Leu Ile Asp His Gly 150 155 Ala Ser Leu Phe Phe His His Ser Trp Val Asn Trp His Lys His Ala 170 165 Leu Ser Ser Phe Thr Gln Val Lys Asp His Ala Leu Leu Pro Leu Ala 185 Gly Lys Leu Asp Glu Val Asp Ala Glu Phe Arg Lys Leu Leu Thr Ser 200 205 Glu Lys Ile Arg Glu Ile Val Asp Leu Ile Pro Asp Ser Trp Ile Glu Trp Arg Asp Lys Asp Glu Thr Pro Gln Asp Ile Arg Asp Ile Tyr Tyr 235 230 Arg Phe Leu Lys Glu Arg Ile Glu His Ser Glu Ile Phe Val Lys Glu Ala Gln His Ala Arg Lys Ala Tyr Leu 260

<210> 5507

<211> 146

<212> PRT

<213> B.fragilis

<400> 5507

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1 5 10 15

Tyr Leu Ser Ile Leu Thr Leu Val Gly Gly Leu Gly Ala Leu Val 20 25 30

Leu His Tyr Leu Glu Pro Gly His Tyr Phe Gly Gly Tyr Pro Leu Ile 35 40 45

Pro Val Tyr Phe Tyr Ile Phe Gly Val Phe Tyr Ile Tyr Met Phe Asp 50 55 60

Ala Cys Arg Arg His Ala Pro Glu Lys Met Val Met Leu Phe Leu Val 65 70 75 80

Ala Lys Val Leu Lys Met Ile Val Ser Val Phe Leu Leu Ile Ile Tyr 85 90 95

Cys Val Ala Val Pro Asp Ser Ala Ile Glu Phe Leu Leu Thr Phe Leu
100 105 110

Ala Phe Tyr Leu Gly Tyr Leu Ile Tyr Glu Ser Trp Phe Phe Phe Val 115 120 125

Phe Glu Trp Asn Gln Lys Leu Thr Lys Lys Ser Lys Lys Tyr Glu Thr 130 135 140

Val Ala

145

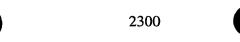
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<213> B.fragilis

420

<400> 5508 Lys Tyr Val Thr Leu His Tyr Met Ala Gln Gln Thr Asp Pro Arg Ile Leu Gly Thr Glu Pro Ile Gly Lys Leu Leu Gln Tyr Ser Ile Pro 25 Ala Ile Ile Gly Met Thr Ile Thr Ser Leu Tyr Asn Ile Ile Asp Ser Ile Phe Ile Gly His Gly Val Gly Pro Met Ala Ile Ser Gly Leu Ala 55 Ile Thr Phe Pro Leu Met Asn Leu Val Val Ala Phe Cys Val Leu Ile 70 75 Ser Ala Gly Gly Ala Thr Ile Ser Ser Ile Arg Leu Gly Gln Lys Asp 85 90 Ile Lys Gly Ala Thr Asp Val Leu Gly Asn Thr Leu Met Leu Cys Leu 105 Thr Asn Ala Val Leu Phe Gly Gly Leu Ala Tyr Leu Phe Leu Asp Pro 120 Ile Leu Phe Phe Gly Ala Ser Thr Gly Thr Leu Pro Tyr Ala Arg 135 140 Asp Phe Met Gln Val Ile Leu Leu Gly Thr Pro Ile Thr Tyr Thr Met 150 155 Ile Gly Leu Asn Asn Val Met Arg Ala Thr Gly Tyr Pro Lys Lys Ala 170 Met Leu Thr Ser Leu Val Thr Val Ile Ala Asn Val Ile Ile Ala Pro 180 185 Val Phe Ile Phe His Phe Gly Trp Gly Ile Arg Gly Ala Ala Met Ala 200 Thr Val Leu Ser Gln Phe Ile Gly Met Ile Trp Val Val Asn His Phe 215 220 Arg Asn Lys Glu Ser Phe Val His Phe Met Pro Gly Phe Trp Lys Met 230 235 Lys Lys Arg Ile Ile Gly Ser Ile Phe Ser Ile Gly Met Ser Pro Phe 245 250 Ala Met Asn Val Thr Ala Cys Ile Ile Val Ile Leu Ile Asn Asn Ser 265 Leu Gln Lys Tyr Gly Gly Asp Met Ala Ile Gly Ala Tyr Gly Ile Ile 275 280 285 Asn Arg Leu Leu Met Leu Tyr Val Met Val Val Met Gly Leu Thr Met 295 Gly Met Gln Pro Ile Val Gly Tyr Asn Tyr Gly Ala Gln Lys Ile Asp 310 315 Arg Val Lys His Thr Leu Arg Leu Gly Ile Ile Val Gly Val Leu Ile 325 330 Thr Ser Ser Gly Phe Ile Ile Cys Glu Leu Phe Pro His Thr Val Ser 345 Ala Ile Phe Thr Asp Ser Asp Glu Leu Ile Asp Met Ala Ser Ser Gly 360 Leu Arg Ile Cys Thr Leu Met Phe Pro Phe Val Gly Ala Gln Ile Val 375 380 Ile Ser Asn Phe Phe Gln Ser Ile Gly Met Ala Lys Ile Ser Ile Phe 390 Leu Ser Leu Ser Arg Gln Leu Val Tyr Leu Leu Pro Gly Leu Leu Leu 410 Leu Pro Pro Leu Tyr Gly Val Lys Gly Val Trp Ile Ser Met Pro Val

425



Ser Asp Gly Leu Ala Phe Val Thr Ala Val Val Ile Leu Met Val Tyr
435

1le Lys Lys Val Lys Glu Lys Thr Ser Gly Gln Lys Leu
450

460

<210> 5509

<211> 330

<212> PRT

<213> B.fragilis

<400> 5509

Thr Glu Val Thr Met Asn Arg Phe Ile Gly Tyr Ile Gln Val Ala Cys
1 10 15

Cys Cys Leu Leu Cys Ala Cys Cys Val Arg Asp Gly Met Asp Glu 20 25 30

Asp Cys Asn Cys Tyr Val Arg Phe Val Tyr Asp Tyr Asn Leu Gln Tyr 35 40 45

Ile Asp Leu Ile His Lys Gln Ala Thr Lys Met Asn Leu Tyr Val Phe 50 55 60

Asp Glu Lys Gly Val Phe Val Thr Glu Ser Glu Glu Glu Ser Gly Ala 70 75 80

Cys Ala Pro Asp Tyr Leu Met Thr Leu Pro Gly Ala Met Ala Gly Arg 85 90 95

Arg Tyr Ile Phe Val Ala Trp Ser Gly Leu Tyr Asp Lys Ser Tyr Asp 100 105 110

Lys Val Thr Leu Thr Pro Gly Val Ser Thr Leu Glu Asp Leu Glu Val 115 120 125

Ser Val Asn Asn Leu Lys Thr Arg Ile Gly Gly Val Val Asp Arg 130 135 140

Glu Leu His Leu Leu Trp His Gly Lys Gln Thr Glu Val Ser Pro Gln 145  $\,$  150  $\,$  155  $\,$  160 Tyr Asn Asp Ile Thr Thr Val Ser Leu Leu Lys Asn Thr Lys Lys

165 170 175

Pho Arg The The Met Chr Met Leu Agn Ser Ser The Hig Val Agn

Phe Arg Ile Ile Met Gln Met Leu Asp Asp Ser Ser Ile His Val Asp 180 185 190

Asp Tyr Asp Phe Arg Ile Ile Ser Pro Asn Gly Arg Tyr Asn His Glu
195 200 205

Asn Gly Leu Leu Gly Asp Glu Thr Asp Glu Lys Val Glu Tyr Thr Ala 210 215 220

Tyr His Thr Glu Asp Asp Pro Glu Thr Gly Ala Ile Ala Lys Leu Asn 225 230 235 240

Thr Leu Arg Leu Met Thr Asp Thr Glu Asn Arg Leu Val Ile Thr His
245 250 255

Lys Ser Ser Gly Asn Val Ile Leu Asp Ile Pro Leu Asn Lys Tyr Leu 260 265 270

Asn Ala Leu Arg Leu Gln Gln Tyr Ala Asp Ile Pro Leu Gln Glu Tyr 275 280 285

Leu Asp Arg Ala Asp Lys His Gly Ile Ile Leu Phe Phe Lys Gly Met 290 295 300

Asp Gly Asn Gly Asn Tyr Ile Ser Val Asp Val Gln Ile Asn Gly Trp 305 310 315 320

Leu Ile Arg Lys Gln Glu Val Asp Gly Val 325 330

<210> 5510

<211> 768

<212> PRT

<213> B.fragilis

<400> 5510 Lys Asp Lys Thr Met Lys Gln Phe His Tyr Thr Ile Gln Thr Leu Ile 10 Arg Asp Arg Arg Ser Cys Val Ile Lys Val Ile Ser Leu Ser Leu Gly 25 Leu Leu Val Ser Ile Ile Leu Phe Ser Arg Val Ala Phe Glu Leu Ser Tyr Asp Asn Cys Phe Gln Asp Val Asp Asn Leu Tyr Ile Val Lys Thr Glu Trp Ile Lys Asp Gly Val Ile Lys Gly Asn Ala Gly Ser Tyr Thr 70 75 Leu Ile Pro Ile Ala Ser Thr Val Ala Glu Glu Phe Pro Lys Glu Val 90 Glu Ser Ala Val Cys Ser Ser Ile Ser Phe Glu Ala Ile Phe Lys Ile 100 105 Gly Asn Arg Lys Met Asn Lys Ser Phe Ile Leu Ser Asp Ser Leu Tyr 120 115 Phe Arg Thr Met Gly Ile Glu Val Ile Ser Gly Asn Pro Asn Asp Leu 135 140 Thr Asn Pro Asp Val Leu Phe Leu Ser Gln Ser Val Ala Arg Glu Ala 150 155 Phe Gly Glu Glu Asn Pro Ile Gly Lys Thr Leu His Met Met Val Trp 170 Gly Thr Pro Val Glu Thr Leu Val Lys Gly Val Phe Ala Asp Leu Pro 185 180 Tyr Asn Val Ser Leu Glu Arg His Glu Ala Val Leu Ser Phe Ala Ser 200 205 His Ser Lys Tyr Gly Trp Gly Arg Pro Gly Trp Thr Ser Gly Gly Asn 215 220 Tyr Asn Ala Phe Ile Arg Leu Lys Asp Gly Glu Arg Ser Ala Asp Val 230 235 Ile Asn Thr Asp Ile Asp Lys Val Ile Ala Lys His Ile Pro Ser Asp 245 250 Met Asn Met His Leu His Met Ile Val Val Pro Leu Arg Thr Ile His 260 265 Leu Glu His Ser Asp Val Lys Arg Thr Ile Leu Ile Leu Ser Leu Leu 280 Gly Phe Ala Ile Leu Phe Ala Ala Thr Met Asn Tyr Val Leu Ile Phe 295 300 Val Ser Ser Leu Ser Gln Arg Ala Lys Gly Ile Gly Ile His Lys Cys 315 Asn Gly Ala Ser Asp Lys Ala Ile Phe Ser Met Phe Ile Tyr Glu Thr 330 325 Ala Leu Ile Ile Gly Val Ser Leu Val Leu Met Ile Ile Phe Leu Phe 345 Gln Phe Gln Glu Lys Ile Glu Glu Leu Ala Glu Val Ser Leu Ser Ser 360 365 Leu Phe Thr Trp His Asn Leu Trp Ala Pro Leu Ser Val Val Thr Phe 375 380 Leu Phe Val Ile Gly Gly Ile Leu Pro Gly Lys Ile Phe Ser Leu Ile 390 395 Pro Val Thr Gln Val Phe His Pro Tyr Ile Lys Glu Asn Arg Gly Trp 410 Lys Arg Ile Leu Leu Phe Ile Glu Phe Ala Gly Val Ala Phe Ile Phe 425 Gly Leu Met Cys Val Ala Tyr Leu Gln Cys His Tyr Ile Ile Asn Arg 440 Asp Met Gly Tyr Gln Pro Lys Gly Val Ala Ser Cys Lys His Asp Phe 455

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Ala Glu Pro Asp Asn Ala Arg Asn Asn Leu Lys Ser Leu Pro Tyr Val 470 475 Glu Gly Val Ala Ser Ile Arg Gly Ser Met Thr Trp Phe Gly Asn Arg 490 Glu Val Thr Asp Glu Gly Gly Lys Val Leu Phe Thr Pro Arg Cys Ala 505 Ala Phe Asp Lys Asp Phe Val Pro Leu Leu Gly Leu His Ile Lys Thr 520 Gly Arg Asn Phe Thr Gly Glu Arg Gln Phe Leu Val Asn Gln Pro Tyr 535 540 Val Glu Lys Met Gly Trp Lys Gly Ser Gly Val Gly Glu Ile Val Pro 550 555 Asn Arg Gly Thr Val Val Gly Val Leu Ala Pro Phe Cys Cys Gly Val 565 570 Leu Pro Ala Asp Asn Glu Pro Leu Glu Ile Glu Tyr Gly Thr Asn Leu 580 585 Arg Asn Val His Val Arg Leu Lys Glu Pro Phe Thr Glu Asn Leu His 605 Arg Leu Asn Asn Glu Met Lys Lys Ile Tyr Pro Gln Glu Asp Ile Glu 615 Phe Arg Ser Leu Glu Gln Asp Leu Glu Arg Tyr Tyr Arg Pro Thr Ile 635 Ile Phe Arg Asp Ala Thr Phe Leu Ala Phe Ile Thr Ile Leu Phe Ile 645 650 Thr Leu Met Gly Leu Ile Gly Tyr Ile Asn Asp Glu Val Arg Arg Arg 665 Ser Lys Glu Ile Ala Ile Arg Lys Ile Asn Gly Ala Glu Ala Arg Ser 680 Ile Leu Phe Leu Leu Ser Lys Asp Ile Phe Trp Val Ala Ile Leu Ser 695 700 Val Ala Ile Gly Thr Tyr Gly Ala Tyr Tyr Met Ser Leu Leu Trp Ile 710 715 Ser Gln Phe Glu Asp Thr Ile Cys Val Tyr Ala Gly Trp Tyr Val Val 725 730 Thr Ala Ile Cys Leu Leu Val Phe Ile Phe Val Phe Ile Ile Gly Arg 745 Ser Trp His Ile Ala Asn Glu Asn Pro Val Asn Ser Ile Lys Ser Glu 760 <210> 5511 <211> 404 <212> PRT <213> B.fragilis <220> <221> UNSURE <222> (99) <223> Identity of amino acid sequences at the above locations are unknown. <400> 5511 Arg Thr Ala Thr Ser Arg Thr Arg Lys Asn Asn Ile Asn Cys Arg Met 10 Ala Thr Lys Leu Trp Thr Leu His Phe Met Arg Ile Cys Leu Ala Asn

Leu Leu Phe Ile Ser Leu Tyr Leu Leu Tyr Pro Val Leu Pro Val 35 40 45 Met Met Ala Ser Arg Leu Gly Val Pro Val Ser Gln Thr Gly Val Ile

Phe Ile Phe Phe Thr Leu Ala Met Phe Phe Ile Gly Pro Phe His Ala

70 75 Tyr Leu Val Asp Val Tyr Lys Arg Lys Tyr Ile Cys Met Leu Ser Phe 85 90 Gly Gly Xaa Gly Cys Ser Asn Gln Pro Gly Tyr Thr Leu Val Gln Asn 100 105 Ala Thr His Leu Leu Met Leu Cys Ile Val Gln Gly Leu Ser Phe Gly 120 Met Ala Ala Thr Ala Gly Ile Thr Leu Ala Ile Asp Ile Thr Asn Ser 135 Thr Phe Arg Ser Ala Gly Asn Val Val Phe Ser Trp Ala Ala Arg Leu 155 Gly Met Ile Ile Gly Ala Ala Leu Gly Val Tyr Leu Phe Arg Thr His 165 170 Gly Phe Glu Thr Leu Leu Tyr Val Ala Val Ala Leu Gly Ala Leu Gly 180 185 Ile Leu Phe Val Ser Arg Val Tyr Val Pro Phe Arg Ala Pro Ile Gly 195 200 205 Met Lys Val Cys Ser Met Asp Arg Phe Leu Leu Arg Gly Leu Ile 215 220 Pro Ala Phe Asn Leu Ile Leu Ile Ala Phe Ile Pro Gly Leu Met Leu 230 235 Pro Val Leu Ala Gly Ala Pro Ser Asp Val Pro Val Gly Gly Glu Thr 245 250 Val Pro Phe Phe Ala Leu Val Gly Cys Gly Phe Leu Leu Ser Val Leu 265 Ile Val Lys Leu Phe Phe Arg Tyr Asp Asn Lys Met Trp Leu Gln Ile 280 Val Val Gly Leu Val Thr Val Ile Gly Ser Met Ala Met Leu Phe Ser 295 300 Pro Glu Thr Ser Trp Asn Ala Pro Ala Ala Val Leu Met Gly Leu Gly 310 315 Leu Gly Leu Val Thr Pro Glu Phe Leu Met Met Phe Val Lys Leu Ser 325 330 Gln His Cys Gln Arg Gly Thr Ala Asn Thr Thr His Leu Leu Ala Trp 340 345 Glu Leu Gly Val Gly Leu Gly Ile Ala Ser Ala Cys His Leu His Leu 360 365 Thr Ala Asn Glu Gln Ala Val Tyr Arg Val Gly Leu Leu Ser Ala Ile 375

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<210> 5512
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Lys Lys Val Arg

## <400> 5512

Asn Ala Arg Thr Leu Pro Ala Pro Trp Trp Lys Thr Asp Pro Thr Thr

1 5 10 15

Ser Gly Arg Thr Glu Glu Glu Val Val Asp His Val Arg Met Val Leu

Val Ser Leu Ala Phe Phe Val Leu Leu Thr Tyr Pro Tyr Phe Lys Arg

395

Ser Gly Arg Thr Glu Glu Gln Val Val Asn His Val Arg Met Val Leu 20 25 30

Tyr Glu Thr Lys Asn Asn Thr Val Arg Tyr Ser Trp Asp Leu Asn Val 35 40 45

Ser Thr Asp Gly Met Asn Glu Phe Thr Gly Gly Asp Val Val Arg Gly 50 55 60 Glu Asp Val Pro Ser Ala Thr Pro Thr Val Ser Arg Phe Val Thr Val

<sup>&</sup>lt;211> 466

<sup>&</sup>lt;212> PRT

<sup>&</sup>lt;213> B.fragilis

70 75 Gly Arg Glu Val Val Lys Gln Asp Tyr Glu Leu Leu Ile Leu Ile Asn 90 85 Pro Pro Gly Glu Leu Leu Glu Ile Thr Glu Gln Gly Asn Pro Arg Ser 105 Tyr Leu Ser Arg Ala Ala Asn Met Thr Lys Glu Ser Leu Ile Gln Pro 120 Tyr Gly Ile Ala Ala Asp Asn Asn Phe Tyr Met Thr Asn His Gln Asp 135 Leu Ile Phe Val Pro Glu Val Glu Leu Arg Asp Asn Gln Arg Met Ala 155 150 Glu Glu Asn Pro Val Arg Val Glu Val Glu Arg Ala Val Ala Lys Val 165 170 Val Val Ser Gly Val Pro Glu Val Val Pro His Gly Asp Arg Ile Asp 185 180 Asn Leu Lys Trp Gly Leu Asp Val Thr Asn Met Tyr Thr Tyr Trp Met 205 200 Arg Lys Met Thr Phe Ile Ala Asn Ser Gly Gly Val Pro Asn Glu Met 215 210 Glu Gln Leu Asn Ala Gly Tyr Arg Glu Glu Arg Tyr Ala Glu Asp Pro 230 235 Asn Phe Thr Arg Phe Ser Ser Trp Asn Gly Gly Asn Pro Val Gly Gln 245 250 Phe Glu Tyr Leu Ser Gly Thr Pro Glu Leu Ser Lys Asn Phe Asp Asp 265 Tyr Asp Tyr Thr Leu Glu Asn Thr Met Asp Ala Ala Asp Gln Arg His 280 275 Asp Val Thr Thr Arg Val Val Ile Ser Gly Thr Tyr Thr Pro Asn Gly 300 295 Phe Gly Ser Val Ala Thr Arg Asn Gly Gly Gly Ile Ser Phe Tyr Tyr 310 315 Phe Lys Gly Asn Ala Ile Arg Val Glu Ala Met Arg Asp Met Val Asn 330 325 Asp Arg Gly Gln Ile Pro Gln Glu Leu Arg Asp Ala Gly Leu Glu Gln 345 Ala Ile Glu Asn Val Leu Ala Trp Asn Pro Asn Ala Phe Asn Ser Pro 360 Thr Val Ser Phe Ser Glu Gly Gly Ile His Phe Tyr Tyr Gln Gly Val 375 Cys Tyr Tyr Thr Val Leu Ile Arg His Phe Ser Asn Asn Met Val Pro 395 390 Val Leu Met Gly Tyr Gly Arg Tyr Gly Val Val Arg Asn Asn Val Tyr 405 410 Gln Leu Ser Ile Asn Lys Ile Ile Gly Pro Gly Gln Pro Val Ile Asn 425 Pro Pro Gly Thr Asp Pro Asp Asp Glu Asp Thr Ser Trp Ile Ser Ala 445 440 Asp Val Asn Ile Met Arg Trp Tyr Ile Arg Asn Gln Asn Val Glu Glu 455 460 450 Leu Leu 465 <210> 5513

<211> 464

<212> PRT

<213> B.fragilis

<400> 5513

Gly Asn Val Ala Asn Phe Val Ala Asp Lys Leu Leu Phe Val Phe Asn

10 Ile Leu Leu Thr Lys Met Gly Thr Ile Ile Ile Val Asp Asp Asn Lys 25 Gly Val Leu Thr Ala Val Gln Leu Leu Leu Lys Asn His Phe Ser Lys Val Ile Thr Leu Ser Ser Pro Val Ser Leu Ser Thr Val Leu Arg Glu 55 Glu Asn Pro Glu Val Val Leu Leu Asp Met Asn Phe Thr Ser Gly Ile 70 Asn Asn Gly Asn Glu Gly Leu Phe Trp Leu His Glu Ile Lys Arg Gln 90 Tyr Arg Asp Leu Pro Val Val Leu Phe Thr Ala Tyr Ala Asp Ile Asp 100 105 Leu Ala Val Arg Gly Ile Lys Glu Gly Ala Ser Asp Phe Val Val Lys 125 120 Pro Trp Asp Asn Gln Lys Leu Leu Glu Thr Leu Leu Asn Ala Ala Ser 135 Gln Ala Lys Asp Gly Lys Lys Lys Asn Arg Lys Lys Glu Ser Ser Pro 155 150 Val Ser Ala Met Tyr Trp Gly Glu Ser Ser Ala Met Gln Gln Leu Arg 170 165 Thr Leu Ile Glu Lys Val Ala Thr Thr Asn Ala Asn Ile Leu Ile Thr 185 Gly Glu Asn Gly Thr Gly Lys Glu Met Leu Ala Arg Glu Ile His Ala 205 200 Leu Ser Pro Arg Ser Ala Glu Ser Met Ile Ser Val Asp Met Gly Ala 220 215 Ile Thr Glu Ser Leu Phe Glu Ser Glu Leu Phe Gly His Val Lys Gly 230 235 Ser Phe Thr Asp Ala His Ala Asp Arg Thr Gly Lys Phe Glu Ala Ala 250 245 Asp Arg Ser Ser Leu Phe Leu Asp Glu Ile Gly Asn Leu Pro Phe His 265 260 Leu Gln Ala Lys Leu Leu Thr Ala Ile Gln Gln Arg Ser Ile Val Arg 280 Val Gly Ser Asn Gln Ser Ile Pro Val Asp Ile Arg Leu Ile Cys Ala 300 295 Thr Asn Arg Asn Leu Gln Glu Met Val Asp Lys Gly Leu Phe Arg Glu 315 310 Asp Leu Leu Tyr Arg Ile Asn Thr Ile His Val Glu Ile Pro Pro Leu 330 325 Arg Lys Arg Lys Glu Asp Ile Val Pro Leu Ala Glu Arg Phe Ile Ala 345 340 Arg Phe Cys Lys Gln Tyr Asp Lys Ala Ser Ile Ser Leu Ser Pro Ala 365 360 Ala Cys Glu Lys Leu Thr Ala His Ala Trp Tyr Gly Asn Ile Arg Glu 380 375 Leu Glu His Ser Ile Glu Lys Ala Val Ile Ile Ser Asp Gly Glu Thr 395 390 Ile Pro Ala Glu Met Phe Gln Leu Val Gln Lys Thr Glu Asn Pro Glu 410 405 Thr Glu Thr Ser Thr Leu Glu Asp Met Glu Lys Ala Met Ile Arg Lys 425 Ala Leu Asp Lys Cys Gly Gly Asn Leu Ser Ala Val Ala Ala Gln Leu 440 Gly Ile Thr Arg Gln Thr Leu Tyr Asn Lys Met Lys Lys Phe Gly Leu <211> 409 <212> PRT

<213> B.fragilis

<400> 5514 Lys Cys Tyr Phe Cys Ser Leu Asn Asn Ile Ile Leu Phe Tyr Met Asp 10 Ser Asn His Leu Ser Pro Leu Arg Lys Gly Val Val Gly Val Gln Phe 25 Leu Phe Val Ala Phe Gly Ala Thr Val Leu Val Pro Leu Leu Val Gly 40 Leu Asp Pro Ser Thr Ala Leu Phe Thr Ala Gly Ile Gly Thr Leu Leu 55 Phe His Leu Val Thr Lys Gly Lys Val Pro Ile Phe Leu Gly Ser Ser 70 75 Phe Ala Phe Ile Ala Pro Ile Ile Lys Ala Thr Glu Leu Tyr Gly Leu 85 90 Ala Gly Thr Leu Ser Gly Met Val Gly Val Ala Met Val Tyr Phe Val 105 100 Met Ser Ala Leu Val Lys Trp Gln Gly Ile Arg Leu Ile Glu Arg Leu 120 Phe Pro Pro Val Val Ile Gly Pro Val Ile Ile Leu Ile Gly Leu Ser 140 135 Leu Ala Gly Thr Gly Val Asn Met Ala Lys Glu Asn Trp Thr Leu Ala 155 150 Leu Leu Ser Leu Phe Thr Ala Val Ile Val Ser Ile Arg Ala Lys Gly 170 165 Leu Leu Lys Leu Ile Pro Ile Phe Cys Gly Ile Ile Val Gly Tyr Ile 185 180 Ala Ala Leu Ile Phe Tyr Asp Val Asp Met Ser Gly Val Arg Asn Ala 205 200 Ala Trp Leu Gly Phe Pro Gln Phe Val Phe Pro Gln Phe Ser Trp Glu 215 220 Pro Ile Leu Phe Met Met Pro Val Ala Ile Ala Pro Val Ile Glu His 235 230 Ile Gly Asp Val Tyr Val Val Asn Thr Val Thr Gly Lys Asp Tyr Val 250 255 245 Lys Asp Pro Gly Leu His Arg Thr Leu Leu Gly Asp Gly Leu Ala Cys 265 Leu Cys Ala Gly Leu Leu Gly Gly Pro Pro Val Thr Thr Tyr Ser Glu 280 Val Thr Gly Ala Met Ser Leu Thr Lys Val Thr Asn Pro Gln Val Ile 300 295 Arg Ile Ala Ala Ile Thr Ala Ile Leu Phe Ser Val Ile Gly Lys Val 315 310 Ser Ala Leu Leu Lys Ser Ile Pro Ser Ala Val Leu Gly Gly Ile Met 330 325 Leu Leu Phe Gly Thr Ile Ala Cys Ala Gly Ile Ala Asn Leu Val 345 Asn Asn Cys Ile Asp Leu Ser Arg Thr Arg Asn Ile Ile Val Ser 360 Leu Thr Leu Thr Ile Gly Ile Gly Gly Ala Val Leu Ala Trp Gly Glu 380 375 Phe Ser Leu Ser Gly Ile Gly Leu Ala Ala Leu Val Gly Val Gly Leu

395

390

Asn Leu Val Leu Pro Lys Glu Glu Arg 405 <211> 310 <212> PRT

<213> B.fragilis

<400> 5515

Thr Pro Tyr Ala Asn Met Gly Arg Trp Ile Ile Leu Leu Trp Trp Arg
1 5 10 15

Leu Gln Leu Glu Thr Arg Leu His Cys Asn Ile Leu Leu Arg Leu Ala 20 25 30

Gly Ala Ala Ile Gly Glu Tyr Phe Arg Asp Thr Gly Arg His Ala Leu 35 40 45

Val Val Tyr Asp Asp Leu Ser Lys Gln Ala Val Ser Tyr Arg Glu Val 50 55 60

Ser Leu Ile Leu Arg Arg Pro Ser Gly Arg Glu Ala Tyr Pro Gly Asp 65 70 75 80

Ile Phe Tyr Leu His Ser Arg Leu Leu Glu Arg Ala Ala Lys Ile Ile 85 90 95

Asn Gln Glu Glu Val Ala Arg Glu Met Asn Asp Leu Pro Glu Ser Leu 100 105 110

Lys Gly Lys Val Lys Gly Gly Gly Ser Leu Thr Ala Leu Pro Ile Ile 115 120 125

Glu Thr Gln Ala Gly Asp Val Ser Ala Tyr Ile Pro Thr Asn Val Ile 130 135 140

Ser Ile Thr Asp Gly Gln Ile Phe Leu Asp Thr Asp Leu Phe Asn Gln 145 150 155 160

Gly Asn Arg Pro Ala Ile Asn Val Gly Ile Ser Val Ser Arg Val Gly 165 170 175

Gly Asn Ala Gln Ile Lys Ala Met Lys Lys Val Ala Gly Thr Leu Lys 180 185 190

Ile Asp Gln Ala Gln Tyr Arg Glu Leu Glu Ala Phe Ser Lys Phe Ser 195 200 205

Gly Asp Met Asp Pro Val Thr Ala Leu Thr Ile Asp Lys Gly Gln Lys 210 215 220

Asn Ala Arg Leu Leu Val Gln Pro Gln Tyr Ser Pro Met Pro Val Glu
225 230 235 240

Lys Gln Ile Ala Ile Leu Tyr Cys Gly Ile His Gly Leu Leu Arg Asn
245
250
255

Leu Ala Leu Asp His Gln Ala Asp Val Leu Asp Val Leu Lys Thr Gly 275 280 285

Val Ile Asn Asp Glu Val Thr Lys Ala Ile Glu Glu Thr Ala Ala Met 290 295 300

Val Ala Lys Gln Tyr Ser 305 310

<210> 5516

<211> 292

<212> PRT

<213> B.fragilis

<400> 5516

Lys Ile Met Ala Ser Leu Lys Glu Val Lys Thr Arg Ile Asn Ser Val 1 5 10 15 Gln Ser Thr Arg Lys Ile Thr Ser Ala Met Lys Met Val Ala Ser Ala

Gln Ser Thr Arg Lys IIe Thr Ser Ala Met Lys Met Vai Ala Ser Ala
20 25 30

Lys Leu His Lys Ala Gln Gly Ala Ile Glu Asn Met Leu Pro Tyr Gln 35 40 45 Arg Lys Leu Asn Lys Ile Leu Thr Asn Phe Leu Ser Ala Asp Leu Pro

60 55 Val Glu Ser Pro Phe Cys Val Glu Arg Pro Val Lys Arg Val Ala Ile 75 70 Val Ala Phe Ser Ser Asn Ser Ser Leu Cys Gly Ala Phe Asn Ala Asn 90 Val Leu Lys Met Phe Leu Gln Thr Val Gly Glu Tyr Arg Glu Leu Gly 105 Gln Asp Asn Ile Leu Ile Tyr Pro Val Gly Lys Lys Ile Glu Glu Ala 120 125 Val Lys Lys Leu Gly Phe Phe Pro Gln Gly Ser Tyr Gln Lys Leu Ala 135 Asp Lys Pro Ser Tyr Asp Glu Ala Ala Ala Leu Ala Lys Leu Leu Met 150 155 Glu Leu Phe Leu Glu Lys Asn Ile Asp Arg Val Glu Leu Ile Tyr His 170 165 His Phe Lys Ser Met Gly Val Gln Glu Leu Leu Arg Glu Arg Tyr Leu 185 Pro Ile Asp Leu Ser Ala Val Gln Asn Asp Glu Glu Arg Gly Gly Val 200 Val Asn Asp Tyr Ile Ile Glu Pro Ser Ala Ala Gln Leu Ile Ala Asp 220 Leu Ile Pro Gln Val Leu Ser Gln Lys Ile Phe Thr Ala Ala Leu Asp 235 230 Ser Asn Ala Ser Glu His Ala Ala Arg Thr Leu Ala Met Gln Ile Ala 250 245 Thr Asp Asn Ala Asn Glu Leu Ile Gln Glu Leu Thr Lys Gln Tyr Asn 265 Lys Thr Arg Gln Gln Ala Ile Thr Asn Glu Leu Leu Asp Ile Val Gly 280 275 Gly Ser Met Ala 290 <210> 5517 <211> 285 <212> PRT <213> B.fragilis <400> 5517 Arg Lys Leu Tyr Leu Cys Ile Glu Phe Ser Cys Thr Lys Ile Lys Ile 10 Met Arg Gln Ile Lys Gly Ile Thr Ala Ile Phe Leu Cys Cys Leu Leu Val Ala Gly Cys Asp Leu Ile Asp Tyr His Pro Tyr Asp Val Asp Ile 40 Lys Gly Glu Arg Asp Ile Asn Ala Lys Asn Ile Gln Lys Ile Glu Ala 55 Lys Cys Leu Gly Lys Ser Thr Ile Arg Phe Ile Ala Met Gly Asp Ser 75 70 Gln Arg Trp Tyr Asp Glu Thr Val Asp Phe Val Asn Ala Val Asn Lys 90 Arg Asp Asp Ile Asp Phe Val Val His Gly Gly Asp Phe Ser Asp Phe 105 Gly Leu Thr Asp Glu Phe Leu Trp Gln Arg Asp Ile Met Asn Lys Leu Lys Val Pro Tyr Val Gly Leu Ile Gly Asn His Asp Cys Leu Gly Thr 135 140 Gly Glu Asp Ala Phe Arg Gln Ile Phe Gly Asp Thr Asn Phe Ser Phe

155

Ile Ala Gly Gly Val Lys Phe Val Cys Leu Asn Thr Asn Ala Met Glu

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175 170 165 Tyr Asp Tyr Ser Glu Pro Ile Pro Asp Phe Asp Tyr Ile Glu Arg Gln 185 Leu Thr Glu Arg Ala Asp Glu Phe Asn Lys Thr Val Phe Cys Met His 205 200 Ala Arg Pro Leu Cys Asp Gln Phe Asn Asn Asn Val Ala Lys Val Phe 215 Gln Met Tyr Val Arg Gln Phe Pro Gly Leu Gln Phe Cys Thr Val Ala 235 230 His Glu His Arg Ile Ser Ala Ser Asp Val Phe Asp Asp Gly Val Met 250 245 Tyr Tyr Gly Ser Asn Cys Met Lys Asn Arg Ser Tyr Leu Val Phe Thr 265 Ile Lys Pro Asp Gly Tyr Asp Tyr Glu Val Val Glu Phe 280 <210> 5518 <211> 326 <212> PRT <213> B.fragilis <400> 5518 Ser Ile Thr Gln Thr Ala Val Met Lys Asn Tyr Ile Val Asn Glu Leu 10 Ile Ala Ala Met Lys Glu Arg Ile Pro Arg Gly Ile Asn Leu Ala Asn 25 Tyr Leu Thr Asp Ala Leu Cys Met Gly Lys Glu Ala Val Tyr Arg Arg 40 Leu Arg Gly Glu Val Ala Phe Thr Phe Asp Glu Ile Ala Met Ile Ser 5.5 Cys Lys Leu Gly Ile Ser Ile Asp Gln Ile Ile Gly Asn His Gln Ser 75 70 Asn Arg Val Thr Phe Asp Leu Asn Leu Leu His Ser Pro Asp Pro Leu 90 85 Glu Ser Tyr Tyr Glu Ile Ile Glu Arg Tyr Leu Arg Ile Phe Asn Tyr 105 Val Lys Asp Asp Ile Ser Thr Lys Ile Tyr Thr Ala Ser Asn Val Ile 120 115 Pro Phe Thr Leu Tyr Ser Ser Tyr Glu Tyr Leu Ser Lys Phe Arg Leu 140 135 Cys Arg Trp Ile Tyr Gln Asn Gly Lys Ile Arg Thr Pro Asn Ser Leu 150 155 Ser Gly Met His Ile Pro Asp Lys Ala Val His Ala His Lys Leu Leu 165 170 Ser Glu Ala Val Lys Ala Cys Arg Lys Thr Cys Phe Ile Trp Asp Ser 185 190 180 Asn Val Phe Tyr Ser Phe Val Lys Glu Met Lys Tyr Phe Ala Gly Leu 200 Asn Leu Ile Ser Glu Thr Asp Leu Ile His Leu Lys Asn Glu Leu Glu 220 215 Leu Leu Leu His Glu Leu Glu Gln Ile Ser Ala Lys Gly Glu Phe Ser 235 230 Asn Gly Asn Lys Val Ala Ile Tyr Leu Ser Asn Ile Asp Phe Glu Ala 250 245 Thr Tyr Ser Tyr Ile Glu Lys Lys Asp Phe Gln Ile Ser Leu Leu Arg 265 Val Tyr Ser Ile Asn Ser Met Asp Ser Gln Ser Pro Arg Ile Cys Gly

275 280 285

Ile Gln Lys Asp Trp Ile Gln Ser Leu Lys Arg His Ser Thr Leu Ile

290 295 300

Ser Glu Ser Gly Glu Ser Gln Arg Ile Thr Phe Leu Glu Gln Gln Lys
305 310 315 320

Ser Phe Ile Asp Thr Leu

<210> 5519 <211> 328 <212> PRT

325

<213> B.fragilis

<400> 5519

Thr Glu Lys Gln Tyr Lys Leu Lys Ile Met Ile Thr Asn Glu Leu Asn 1 5 10 15

Ile Gly Leu Ile Glu Ala Ala Lys Glu Lys Met Pro Thr Gly Thr Asn 20 25 30

Leu Ala Asn Thr Leu Met Asp Ile Leu Tyr Ile Gly Lys Glu Ala Ile 35 40 45

Tyr Arg Arg Leu Arg Gly Glu Val Pro Phe Thr Leu Ala Glu Ala Ala 50 55 60

Val Ile Ser Arg Lys Leu Gly Ile Ser Leu Asp Lys Met Ile Gly Val 65 70 75 80
Ser Phe Ser Asn Asn Ala Val Phe Asp Leu Asn Val Val His His Thr

85 90 95
Asn Thr Phe Glu Thr Tyr His Asp Ile Leu Thr Lys Tyr Val Asn Ala

100 105 110

Phe Asp Asn Ile Arg Glu Asp Pro Thr Thr Glu Met Ala Thr Ser Ser

115 120 125

Asn Ile Leu Pro Gln Ala Leu Tyr Leu Lys His Asp Val Leu Ser Lys 130 135 140 Phe Arg Leu Phe Lys Trp Met Tyr Gln Asn Glu Asn Ile Lys Cys Lys

145 150 155 160
His Phe Asp Glu Leu Glu Ile Pro His Lys Ile Tyr Asn Ile Gln Lys

165 170 175
Asp Phe Val Asn Met Thr Gln Gln Met Lys Thr Thr Asp Tyr Ile Trp

180 185 190
Asp Asn Thr Val Phe Glu His Val Val Arg Asp Ile Gln Phe Phe Ser
195 200 205

Glu Ile His Leu Val Ser Glu Glu Asp Lys Glu Leu Ile Lys Asp Asp 210 215 220

Leu Leu Leu Thr Asp Glu Leu Glu Glu Leu Ala Gly Lys Gly Lys 225 230 235 240

Tyr Glu Thr Gly Asn Asp Val Arg Ile Tyr Ile Ser Asn Ile Lys Phe 245 250 255

Asp Ala Thr Tyr Ser Tyr Val Ala Thr Ser Asn Ser His Ile Ser Met 260 265 270

Ile Arg Ile Tyr Ser Ile Asn Ala Ile Thr Thr Gln Asp Asp Gly Met 275 280 285

Phe Arg Ser Leu Lys Glu Trp Val Gln Ser Leu Lys Lys Phe Ser Thr 290 295 300

Gln Ile Ser Glu Ser Gly Glu Met Gln Arg Ile Arg Phe Phe Asn Glu 305 310 315 320

Gln Arg Glu Ile Ile Asn Thr Leu

<210> 5520

<211> 463

<212> PRT

<213> B.fragilis

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Leu Phe Asp Cys Asp Gly Val Ile Val Asp Thr Glu Gly Gln Tyr Thr
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Val Phe Trp Asn Glu Met Gly Gln Lys Tyr Val Asn Asp Ala Asn Phe
                            40
Gly Ser Lys Val Lys Gly Gln Thr Leu Val Gln Ile Tyr Asp Lys Tyr
                                            60
                        55
Phe Ala Gly Glu Pro Glu Lys Gln Arg Asp Ile Thr Glu Ala Leu Asn
                                        75
                    70
Arg Phe Glu Ile Lys Met Asn Tyr Asp Tyr Val Pro Gly Ile Val Glu
                                    90
Phe Ile Ala Asp Leu Arg Arg His Gly Val Lys Ile Ala Leu Val Thr
                                105
            100
Ser Ser Asn Thr Ala Lys Met Glu Asn Val Tyr His Ala His Pro Glu
                            120
Phe Lys Ser Leu Phe Asp Glu Ile Leu Thr Ala Glu Arg Phe Lys Arg
                       135
Ser Lys Pro Asp Pro Glu Cys Phe Leu Leu Gly Met Thr Ile Phe Gly
                                        155
                    150
Ser Asp Ser Lys Asp Ser Tyr Val Phe Glu Asp Ser Phe His Gly Leu
                                    170
                165
Gln Ala Gly Arg Ser Ser Gly Ala Ile Val Val Gly Leu Ala Thr Thr
                                185
            180
Asn Ser Arg Glu Ala Ile Ala Asp Lys Ala Asp Tyr Val Ile Asp Asp
                                                205
                            200
Phe Arg Gly Met Thr Tyr Glu Lys Leu Leu Thr Ile Thr Ser Arg Tyr
                                            220
                        215
Ile
225
<210> 5522
<211> 228
<212> PRT
<213> B.fragilis
<400> 5522
Tyr His Phe Asn Leu Lys Ile Met Thr Tyr Leu Ala Thr Asn Pro Leu
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Phe His Gly Ile Ser Pro Glu Thr Leu Ser Arg Asp Phe Asp Gly Ile
                                25
Val Ser His Leu Arg Met Phe Arg Lys Gly Asp Ile Leu Ala Arg Gln
                            40
Gly Asp Val Cys Asn Arg Leu Met Ile Leu Leu Lys Gly Ser Val Arg
                         55
Gly Glu Met Ile Asp Tyr Ser Gly Arg Leu Ile Lys Val Glu Asp Ile
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70

100

Ile Ala Pro Arg Ala Ile Ala Pro Leu Phe Leu Phe Gly Ala Asp Asn

Arg Tyr Pro Val Glu Val Thr Ala Asn Glu Ala Thr Glu Val Phe Glu

90

110

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Ile Pro Lys Glu Ser Val Leu Lys Leu Phe Arg Arg Asn Glu Lys Phe 120 125 Leu Glu Asn Tyr Met Asn Leu Ser Ala Asn Tyr Ala Arg Thr Leu Ala 135 Asp Lys Leu Phe Phe Met Ser Phe Lys Thr Ile Arg Gln Lys Leu Ala 150 155 Ser Tyr Leu Leu Arg Met Leu Lys Gln Gln Gly Asp Ser Pro Ile Gln 165 170 Leu Asp Arg Ser Gln Gln Glu Leu Ala Asp Tyr Phe Gly Val Ser Arg 185 Pro Ser Leu Ala Arg Glu Leu Ala His Met Gln Asp Asp Gly Leu Ile 200 205 Lys Thr Asp Arg Lys Leu Val His Ile Leu Arg Lys Glu Asp Met Met 215 Gln Leu Ile Gln 225 <210> 5523 <211> 70 <212> PRT <213> B.fragilis <400> 5523 Ser Leu His Asn Ala Lys His Gln Gln Met Cys Ser Val Leu His Gln Arg Ile Thr Arg Leu Val Ala Ala Thr Lys Thr Pro Lys Arg Lys His 2.5 Thr Tyr Ile Phe Pro Leu Val Asn Ile Asp Gln Ile Gly Met Glu Arg 40 Ala Asp Lys Lys His Cys Lys Arg Lys Lys Tyr Lys Tyr Asp Ser Arg Leu Thr Asp Arg His Ala <210> 5524 <211> 131 <212> PRT <213> B.fragilis <400> 5524 Lys Lys His Asn Met Pro Glu Lys His Ile Tyr Glu Tyr Ala Val Val Arg Ile Val Pro Lys Val Glu Arg Glu Glu Phe Ile Asn Val Gly Val 2.5 Ile Leu Phe Ser Lys Gln Ala Ala Phe Ile Arg Met Arg Tyr Glu Ile Asn Lys Lys Arg Leu Glu Ala Leu Ser Pro Glu Pro Asp Ile Asp Ser 55 Phe Arg Lys Tyr Leu Glu Ala Phe Ser Lys Val Cys Ala Gly Cys Pro 70 Thr Gly Gly Gly Ile Ala Lys Leu Glu Val Pro Glu Arg Phe Arg Trp 90 Leu Thr Ala His Arg Ser Ser Cys Ile Gln Thr Ser Arg Pro His Val 105 Gly Tyr Ser Asp Asn Leu Glu Glu Thr Leu Glu Arg Leu Phe Glu Glu 120 Leu Val Leu 130

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     Phe Arg Gly Lys Tyr Thr Val Phe Val Arg Glu Asn Gly His Phe Ser
                                          10
     Thr Glu Arg Glu Tyr Ala Asp Thr Phe Phe Ser Ile Arg Ile Leu His
     Lys Asn Val Arg Phe Ile Arg Glu Ile Glu Lys Lys Asp Lys Asn Arg
                                  40
     Ser Phe Leu Leu Gly Asn Met Ser Tyr Phe Val Thr Phe Ala Pro Pro
     Tyr Ser Ile Ala
     65
     <210> 5526
     <211> 92
     <212> PRT
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     <400> 5526
     Thr Ile Leu Lys Leu Lys Ile Met Leu Leu Ser Val Leu Leu Gln Ala
£.;
13
                                          10
     Ala Ala Ala Gly Val Gly Leu Ser Lys Leu Gly Ala Ala Leu Gly Ala
L.F
     Gly Leu Ala Val Ile Gly Ala Gly Ile Gly Ile Gly Lys Ile Gly Gly
13
                                  40
fΨ
     Ser Ala Met Glu Gly Ile Ala Arg Gln Pro Glu Ala Ser Gly Asp Ile
O
                              55
Arg Met Asn Met Ile Ile Ala Ala Leu Val Glu Gly Val Ala Leu
                          70
                                              75
∄
     Leu Ala Leu Val Val Cys Leu Leu Val Leu Phe Leu
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# ##
<210> 5527
     <211> 379
     <212> PRT
     <213> B.fragilis
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     Leu Ile Val Asp Asp Val Met Ser Asn Val Leu Leu Leu Lys Val Leu
                                      25
     Leu Thr Asn Glu Lys Phe Asn Ile Val Thr Ala Ser Asn Gly Asn Gln
     Ala Leu Asp Gln Val Lys Lys Glu Asn Pro Asp Leu Ile Leu Leu Asp
                              55
                                                  60
     Val Met Met Pro Asp Met Ser Gly Phe Glu Val Ser Gln Lys Leu Lys
     Ala Asp Pro Glu Ala Ala His Ile Pro Ile Ile Phe Leu Thr Ala Leu
                                          90
     Asn Ser Thr Ala Asp Ile Val Lys Gly Phe Gln Val Gly Gly Asn Asp
                  100
                                      105
      Phe Ile Ser Lys Pro Phe Asn Lys Glu Glu Leu Ile Ile Arg Val Ser
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115 120 125 His Gln Ile Ser Leu Val Ala Ala Lys Arg Ile Ile Glu Ala Lys Thr

<210> 5525

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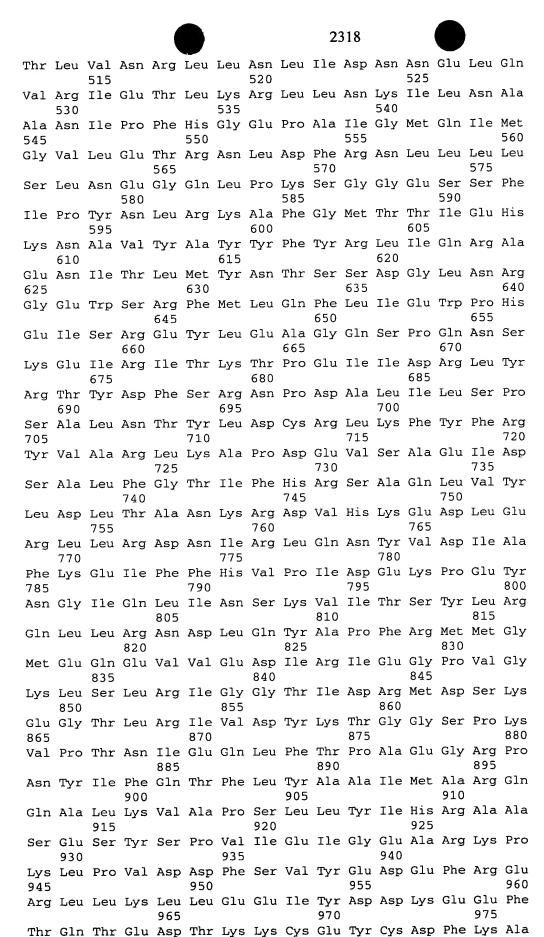
135 140 Glu Glu Leu Lys Lys Thr Ile Ile Gly Arg Asp Lys Leu Tyr Ser Val 150 155 Ile Ala His Asp Leu Arg Ser Pro Met Gly Ser Ile Lys Met Val Leu 165 170 Asn Met Leu Ile Leu Ser Leu Pro Lys Glu Lys Ile Gly Glu Asp Met 185 Tyr Glu Leu Leu Thr Met Ala Asn Gln Thr Thr Glu Asp Val Phe Ser 200 205 Leu Leu Asp Asn Leu Leu Lys Trp Thr Lys Ser Gln Ile Gly Lys Leu 215 Lys Val Val Tyr Gln Asp Ile Asp Met Val Glu Val Glu Gly Val 230 235 Gly Glu Ile Phe Ala Met Val Ala Gly Leu Lys Asn Ile Arg Leu Arg 245 250 Ile Glu Ser Pro Glu Cys Gln Ala Val His Ala Asp Ile Asp Met Ile 260 265 270 Lys Thr Val Ile Arg Asn Leu Ile Ser Asn Ala Ile Lys Phe Ser Asn 280 Glu Gly Ser Glu Val Leu Ile Lys Val Glu Glu Ser Asp Gly Met Ser 295 300 Val Val Ser Val Lys Asp Ser Gly Cys Gly Ile Asp Glu Glu Ser Gln 310 Lys Lys Leu Leu His Thr Asp Thr His Phe Ser Thr Phe Gly Thr Asn 330 325 Asn Glu Glu Gly Ser Gly Leu Gly Leu Leu Cys Gln Asp Phe Val 345 Val Lys Asn Gly Gly Lys Leu Trp Phe Thr Ser Val Lys Asp Glu Gly 360 365 Ser Thr Phe Tyr Phe Ser Ile Pro Leu Lys Lys 370 375 <210> 5528 <211> 532 <212> PRT <213> B.fragilis <400> 5528 Ile Cys Thr Lys Phe Arg Asp Tyr Met Lys Thr Val Lys Thr His Ile Thr Gln Leu Leu His Ala Met Asn Lys Gly Ile Phe Glu Lys Glu His 2.0 25 Pro Ile Ala Leu Ser Leu Leu Ser Ala Ile Ser Gly Glu Ser Ile Phe Phe Leu Gly Pro Pro Gly Val Ala Lys Ser Leu Ile Ala Arg Arg Leu 55 60 Lys Leu Ala Phe Asp Gln Ser Thr Ala Phe Glu Tyr Leu Met Ser Arg Phe Ser Thr Pro Asp Glu Ile Phe Gly Pro Val Ser Ile Ser Lys Leu 85 90 Lys Asp Glu Asp Lys Tyr Glu Arg Ile Ile Glu Gly Tyr Leu Pro Ser 105 Ala Thr Ile Val Phe Leu Asp Glu Ile Trp Lys Ala Gly Pro Ser Ile 120 125 Gln Asn Ser Leu Leu Thr Val Ile Asn Glu Lys Val Tyr Arg Asn Gly 135 Gln Tyr Thr Ile Gln Leu Pro Leu Lys Gly Leu Ile Ala Ala Ser Asn 150 155 Glu Leu Pro Ala Gln Gly Glu Gly Leu Glu Ala Leu Trp Asp Arg Phe

				(					2.	310					
				165					170				_	175	
Leu	Ile	Arg	Tyr 180		Ile	Gly	Asn	Ile 185	Glu	Gln	Glu	Phe	Ala 190	Phe	Asp
Gln	Met	Ile 195	Ala	Ser	Val	Asn	Asp 200		Glu	Ala	Glu	Ile 205	Pro	Thr	Gly
Leu	Ser 210		Thr	Glu	Glu	Gln 215		Thr	Asp	Trp	Arg 220	Thr	Gln	Ile	Ser
Gln 225	Ile	Lys	Ile	His	Tyr 230	Thr	Val	Phe	Glu	Leu 235	Ile	His	Ser	Ile	Lys 240
			Glu	245					250					255	
			Ile 260					265					270		
_		275	Ala				280					285			
	290		Leu			295					300				
305			Gln		310					315					320
			Gly	325					330					335	
			Lys 340					345					350		
		355	Val				360					365			
	370		Leu Lys			375					380				
385			Leu		390					395					400
			Ile	405					410					415	
			420 Glu					425					430		
		435	Glu				440					445			
	450		Tyr			455					460				
465	-				470					475					480
			Val	485					490					495	
			500 Asn					505					510		
	Lys	515				,	520			-		525	_		
	530		-												
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Ser	0> 5! Lys		Lys	Ile	Gln	Gln	Thr	Gly		Arg	Ile	His	Ala		Pro
1 Leu	Pro	Asn	Gly	5 Ile	Gln	Lys	His		10 Arg	Leu	Ser	Val		15 Cys	Arg
Δτα	Ara	Asn	20 Asn	Ara	Ive	Ser	Met	25 Lvs	ጥ ኮ	Phe	Leu	Gln	30 Leu	Val	Ala

Arg Arg Asn Asn Arg Lys Ser Met Lys Thr Phe Leu Gln Leu Val Ala

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Gln Asp Leu Tyr Cys Lys Ile Gly Asn Asp Leu Ser Arg Thr Ala Ile Ile Phe Pro Asn Lys Arg Ala Ser Leu Phe Phe Asn Glu His Leu Ala Asn Gln Ser Asp Gln Pro Leu Trp Ser Pro Ala Tyr Leu Ser Ile Ser Glu Leu Phe Gln His Leu Ser Val Leu Lys Leu Gly Asp Pro Ile Arg Leu Val Cys Glu Leu Tyr Lys Ile Phe Arg Glu Glu Thr Asn Ser Asp Glu Ser Leu Asp Asp Phe Tyr Phe Trp Gly Glu Leu Leu Ile Ser Asp Phe Asp Asp Val Asp Lys Asn Leu Val His Ala Asp Lys Leu Phe Thr Asn Leu Gln Asp Leu Lys Asn Val Met Asp Asp Tyr Glu Phe Leu Asp Gln Glu Gln Gln Ala Ile Gln Gln Phe Phe Gln Asn Phe Ser Ile Glu Lys Arg Thr Leu Leu Lys Glu Lys Phe Ile Ser Leu Trp Asp Lys Leu Gly Asp Ile Tyr Arg Arg Tyr His Lys Lys Leu Glu Glu Leu Gly Phe Ala Tyr Glu Gly Met Leu Tyr Arg Asn Val Ile Glu Gln Leu Glu Pro Asp Ser Leu Lys Tyr Asp Cys Tyr Val Phe Val Gly Phe Asn Val Leu Asn Lys Val Glu Thr His Phe Phe Gln Gln Leu Gln Asn Ala Gly Lys Ala Leu Phe Tyr Trp Asp Tyr Asp Val Phe Tyr Thr Gln Leu Pro Ser Arg Gln Lys Gln Arg His Glu Ala Gly Glu Phe Ile Asn Arg Asn Leu Lys Leu Phe Pro Asn Glu Leu Pro Ala Glu Leu Phe Asn Glu Leu Ile Lys Pro Lys Lys Val Arg Phe Ile Ser Ser Pro Thr Glu Asn Ala Gln Ala Arg Tyr Leu Pro Gln Trp Val His Glu Asn Leu Ser Asn Glu Glu Lys Glu Asn Ala Val Val Leu Cys Asn Glu Ala Leu Leu Pro Val Leu His Ser Ile Pro Glu Val Val Arg Asn Val Asn Ile Thr Met Gly Phe Pro Leu Ala Gln Thr Pro Val Tyr Ser Phe Ile Asn Ala Ile Leu Glu Leu Gln Thr Ser Gly Tyr Arg Thr Asp Ser Gly Arg Tyr Ile Tyr Asp Ala Val Gln Thr Val Leu Lys His Pro Tyr Thr Arg Arg Leu Ser Asp Lys Ala Glu Pro Leu Gln Arg Glu Leu Thr Lys Thr Asn Arg Phe Tyr Pro Phe Pro Ser Glu Leu Lys Lys Asp Lys Phe Leu Asp Ile Leu Phe Thr Pro Arg Asn Gly Ile Arg Glu Leu Cys Val Tyr Ile Thr Glu Leu Leu Lys Glu Val Ser Val Leu Tyr Arg Gln Glu Gln Glu Ser Asp Asp Ile Phe Asn Gln Leu Tyr Arg Glu Ser Leu Phe Lys Ser Phe 



985 990

Met Cys Lys Arg 995

980

<210> 5530

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<213> B.fragilis

<400> 5530

Tyr Arg Gln Lys Lys Gly Pro Val Ser Ala Lys Pro Ser Leu Ser Phe 1 5 10 15

Met Glu Leu Lys His Tyr Ser Asp Leu Met Leu Phe Thr Gly Phe Ser 20 25 30

Leu Ala Ile Cys Gln Asp Leu Pro Ile Met Lys Thr Lys Ile Lys Thr 35 40 45

Asn Lys Gln Ile Ala Val Thr Thr Tyr Gln Pro Ala 50 55 60

<210> 5531 <211> 122

<211> 122 <212> PRT

<213> B.fragilis

<400> 5531

Lys Ser Lys Asn Met Lys Val Ile Asp Leu Thr Lys Glu Ser Phe Val 1 5 10 15

Glu Lys Val Ala Glu Phe Gln Glu Tyr Pro Asn Lys Trp Asp Phe Lys 20 25 30

Gly Asp Lys Pro Cys Leu Val Asp Phe His Ala Pro Trp Cys Val Tyr 35 40 45

Cys Lys Ala Leu Ser Pro Ile Leu Asp Gln Leu Ala Val Glu Tyr Asp 50 55 60

Gly Lys Ile Asp Ile Tyr Lys Val Asp Val Asp Gln Glu Pro Glu Leu 65 70 75 80

Glu Ala Ala Phe Ala Ile Arg Thr Ile Pro Asn Leu Leu Cys Pro
85 90 95

Met Gly Gly Lys Pro Ser Met Lys Leu Gly Thr Met Asn Lys Thr Gln 100 105 110

Leu Lys Ala Leu Ile Glu Glu Val Leu Leu 115 120

<210> 5532

<211> 448

<212> PRT

<213> B.fragilis

<400> 5532

Val Glu Lys Lys Lys Met Lys Lys Ile Tyr Val Leu Ala Leu Leu Ser 1 5 10 15

Cys Leu Leu Met Leu Ser Ala Cys Asp Ser Tyr Leu Asp Ile Arg Pro

Val Gly Ser Val Ile Pro Gln Thr Ala Glu Glu Tyr Arg Ala Leu Leu
35

Ala Arg Ala Tyr Leu Asn Val Pro Asn Asp Arg Gly Leu Ala Cys Leu 50 60

Arg Ser Asp Glu Met Leu Val Asn Asp Asn Glu Tyr Asp Arg Asn Ser 65 70 75 80

Tyr Gly Asp Ile Glu Arg Trp Asn Asp Val Ser Pro Phe Pro Gly Thr

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85 90 Ser Gln Phe Thr Trp Ser Asn Phe Tyr Asn Val Leu Phe Ile Ala Asn 105 Gln Val Ile Glu Ser Gln Lys Glu Ile Thr Glu Gly Thr Pro Glu Val 125 120 Val Asn Gln Leu Val Gly Glu Ala His Leu Leu Arg Ala Tyr Leu His 135 Phe Val Leu Val Asn Leu His Gly Gln Pro Tyr Thr Lys Ser Gly Ala 150 155 Leu Asn Ser Lys Ser Ile Pro Leu Lys Leu Asp Thr Asp Leu Glu Lys 170 165 Thr Leu Gly Arg Asn Thr Val Glu Glu Val Tyr Thr Ser Ile Leu Ser 185 180 Asp Ile Glu His Ala Arg Glu Leu Ile Asn Lys Glu Lys Trp Glu Thr 200 195 Val Phe Ser Tyr Arg Phe Asn Val Leu Ser Val Asp Ala Leu Gln Ser 220 215 Arg Val Ser Leu Tyr Met Gly Ala Trp Pro Lys Cys Leu Glu Ser Ala 230 235 Glu Ala Val Leu Ala Lys Lys Ser Val Leu Val Asp Met Asn Glu Thr 245 250 Pro Leu Ala Leu Pro Asn His Phe Glu Ser Val Glu Ser Ile Thr Ala 265 260 Leu Glu Gln Val Met Gly Ser Ser Val Asn Asn Ala Val Trp Val Pro 280 Ala Thr Phe Leu Ala Leu Tyr Gln Glu Gly Asp Lys Arg Leu Ala Ala 295 Tyr Phe Ala Ala Pro Asp Glu Asn Gly Asn Arg Lys Ser Ser Lys Gly 310 315 Gly Lys Arg Glu Phe Ser Cys Thr Phe Arg Val Gly Glu Leu Tyr Leu 325 330 Asn Ala Ala Glu Ala Ala Asn Met Asp Lys Leu Pro His Ala Arg 350 345 340 Met Arg Leu Leu Glu Leu Met Arg Lys Arg Tyr Thr Pro Glu Ala Tyr 360 Asp Lys Lys Glu Asn Ala Val Asn Val Met Asp Lys Asn Ala Leu Ile 380 375 Ser Glu Ile Leu Asn Glu Arg Ala Arg Glu Leu Ala Phe Glu Gly His 390 395 Arg Trp Phe Asp Leu Arg Arg Thr Thr Arg Pro Arg Met Val Lys Val 410 405 Leu Gln Gly Lys Thr Tyr Ile Leu Glu Gln Asp Asp Pro Arg Tyr Thr 420 425 Ile Pro Ile Pro Arg Asp Ala Ile Ala Ala Asn Pro Gly Leu Ala Asn 435 440 <210> 5533 <211> 560 <212> PRT <213> B.fragilis <400> 5533 Met Cys Arg Asn Tyr Lys Met Glu Gln Glu Gln Arg Phe Ile Gly Tyr 10 Ile Glu Gln Ser Ile Ile Asn Asn Trp Asp Ala Asn Ala Leu Thr Asp 25 Tyr Lys Gly Ile Thr Leu Gln Tyr Lys Asp Val Ala Arg Lys Ile Ala 40

Lys Phe His Ile Ile Leu Glu Met Ala Gly Ile Gln Pro Gly Asp Lys

Ile Ala Val Cys Gly Arg Asn Ser Ala His Trp Ala Val Thr Phe Leu Ala Thr Val Thr Tyr Gly Ala Val Ile Val Pro Ile Leu His Glu Phe Lys Ala Asp Asn Ile His Asn Ile Val Asn His Ser Glu Ala Lys Leu Leu Phe Val Gly Asp Gln Val Trp Glu Asn Leu Asn Glu Asp Arg Met Pro Leu Clu Gly Ile Ser Ser Leu Thr Asp Phe Thr Pro Leu Val Ser Arg Asn Asp Lys Leu Thr Tyr Ala His Glu His Arg Asn Glu Ile Tyr Gly Gln Arg Tyr Pro Lys Asn Phe Arg Pro Glu His Ile Ser Tyr Arg Lys Asp Met Pro Glu Glu Leu Ala Val Ile Asn Tyr Thr Ser Gly Thr Thr Gly Tyr Ser Lys Gly Val Met Leu Pro Tyr Arg Arg Leu Trp Ser Asn Ile Ala Tyr Cys His Glu Met Leu Pro Val Lys Pro Gly Asp His Ile Val Ser Met Leu Pro Met Gly His Val Phe Gly Met Val Tyr Asp Phe Leu Tyr Gly Phe Ser Ala Gly Ala His Leu Tyr Phe Leu Thr Arg Met Pro Ser Pro Lys Ile Ile Ala Gln Ser Phe Ala Glu Ile Lys Pro Arg Val Ile Ala Cys Val Pro Leu Ile Val Glu Lys Ile Ile Lys Lys Asp Ile Leu Pro Lys Leu Asp Asn Lys Ile Gly Lys Leu Leu Leu Arg Val Pro Ile Val Asn Asp Lys Ile Lys Ala Ala Arg Gln Ala Ala Met Glu Ile Phe Gly Gly Asn Phe Asp Glu Ile Ile Gly Gly Ala Pro Phe Asn Ala Glu Val Glu Ala Phe Leu Lys Gln Ile Gly Phe Pro Tyr Thr Ile Ala Tyr Gly Met Thr Glu Cys Gly Pro Ile Ile Cys Ser Ser Arg Trp Glu Thr Leu Lys Gln Ala Ser Cys Gly Lys Ala Thr Ser Arg Met Glu Val Lys Ile Asp Ser Pro Asp Pro Glu Asn Ile Ala Gly Glu Ile Ile Cys Lys Gly Thr Asn Leu Met Leu Gly Tyr Tyr Lys Asn Thr Glu Ala Thr Ser Gln Ile Ile Asp Val Asn Gly Trp Leu His Thr Gly Asp Leu Ala Thr Met Asp Ser Glu Gly Tyr Val Thr Val Arg Gly Arg Ser Lys Asn Met Leu Leu Thr Ser Ser Gly Gln Asn Ile Tyr Pro Glu Glu Ile Glu Ser Lys Phe Asn Asn Met Pro Tyr Val Ser Glu Ser Leu Val Leu Leu Gln Lys Asp Lys Leu Val Ala Leu Ile Tyr Pro Asp Phe Asp Asp Ala Phe Ala His Gly Leu Leu Gln Ser Asp Ile Glu Lys Ile Met Glu Thr Asn Arg Ile Glu Leu Asn Gln Gln Leu Pro Ala 

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Tyr Cys Gln Ile Thr Lys Ile Lys Ile His Phe Glu Glu Phe Glu Lys
                                            540
                        535
Thr Ala Lys Lys Ser Ile Lys Arg Phe Met Tyr Gln Glu Ala Lys Gly
                                        555
                    550
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<211> 83

<212> PRT <213> B.fragilis

<400> 5534

Gly Ile Met Lys Glu Leu His Leu Asn Ile Val Ser Pro Glu Lys Glu 10

Val Phe Asn Gly Glu Val Lys Ser Val Thr Leu Pro Gly Thr Ser Gly 25

Val Phe Ser Ile Leu Pro Gln His Ala Pro Ile Val Ser Ser Leu Gln 40

Glu Gly Thr Val Ser Tyr Thr Thr Thr Asp Gly Glu Glu His Thr Leu 55

Asp Ile His Ser Gly Phe Val Glu Leu Ser Asn Gly Glu Ala Ser Val 70

Cys Val Ser

<210> 5535

<211> 189

<212> PRT

<213> B.fragilis

<400> 5535

Lys Arg Lys Asn Thr Met His Lys Phe Ile Asp Asn Ile Val Ala Phe 10 5

Ser Leu Lys Asn Lys Phe Phe Ile Phe Phe Cys Thr Thr Ile Ala Val 25

Ile Ala Gly Val Val Ser Phe Lys His Thr Pro Ile Asp Ala Phe Pro 40

Asp Val Thr Asn Thr Lys Val Thr Ile Ile Thr Gln Trp Ala Gly Arg 55

Ser Ala Glu Glu Val Glu Lys Phe Ile Thr Ile Pro Val Glu Ile Ala 75

Met Asn Ser Val Gln Lys Lys Thr Asp Ile Arg Ser Thr Thr Leu Phe 90

Gly Leu Ser Val Ile Asn Val Leu Phe Glu Asp His Val Asp Asp Phe 105 100

Val Ala Arg Gln Gln Val Tyr Asn Leu Leu Asn Asp Ala Asp Leu Pro 120 125

Asp Gly Val Thr Pro Glu Val Gln Pro Leu Tyr Gly Pro Thr Gly Glu 135 140

Ile Tyr Arg Tyr Thr Leu Arg Ser Asp Lys Arg Ser Val Arg Glu Leu 150 155

Lys Thr Ile Gln Asp Trp Val Ile Asp Arg Asn Leu Arg Ala Val Ser 170 165

Glu Val Thr Asp Ile Val Ser Phe Asp Gly Glu Val Phe 185

<210> 5536

<211> 76

<212> PRT

<213> B.fragilis

2323 <400> 5536 Ser Phe Arg Lys Cys Lys Ser Glu Met Lys Val Leu Asn Ala Asn Ile 10 Glu Glu Ile His Val Arg Val Lys Pro Ile Lys Thr Ser Tyr Cys Leu Met Leu Gln Ser Lys Ala Leu Ile Pro Asp Asn Thr Pro Tyr Pro Leu 40 Leu Phe Ile Leu Leu Asn Ile Leu Tyr Cys Val Ile Arg Pro Lys Ile Asn Ile Ser Leu Trp Leu Tyr Val Ser Tyr Leu Leu <210> 5537 <211> 248 <212> PRT <213> B.fragilis <400> 5537 Met Ile Arg Asn Lys Val Met Glu Gln Ser Phe Ile Glu Tyr Ser Leu Gly Lys Asp Ala Ser Ser Ala Val Leu Trp Val Tyr Pro Val Arg Lys

Pro Arg Gly Lys Ala Ile Ile Met Cys Pro Gly Gly Phe Asn Gln 40 Ile Ala Ser Asp His Glu Gly Arg Asp Phe Ala Ala Trp Phe Asn Asn 55 Gln Gly Ile Thr Tyr Ala Val Leu Asn Tyr Arg Met Pro Asn Gly Asp 75 70 Val Glu Val Ile Arg Glu Asp Ile Arg Glu Ala Ile Arg Leu Ile Arg 90 85 Arg Gln Ser Ala Glu Trp Gly Ile His Gln Leu Gly Val Met Gly Ala 110 105 Ser Ile Gly Gly Tyr Ile Ala Ala Thr Ala Ala Thr Leu Tyr Thr Gly 120 125 Thr Asp Arg Pro Asp Phe Gln Val Leu Leu Tyr Pro Val Ile Ser Met 135 Thr Asp Arg Leu Thr His Trp Pro Ser Arg Glu Arg Met Leu Gly Glu 155 150 Thr Ile Ser Glu Gly Leu Lys Glu Thr Leu Ser Leu Glu Leu His Val 170 165 Thr Ala Asp Thr Pro Pro Thr Phe Ile Val Leu Ala Glu Asp Asp Gln 185 Ala Val Ser Pro Leu Asn Ser Ile Val Tyr Tyr Thr Ala Leu Leu Lys 200 His Gly Val Ser Ala Gly Leu His Ile Tyr Pro Glu Gly Gly His Ser 220 215

<210> 5538 <211> 67

Leu Gln Lys Trp Leu Leu Thr Phe 245

230

<212> PRT <213> B.fragilis

<400> 5538

Arg Glu Ser Asp Lys Ile Lys Asp Leu Phe Ile Phe Arg Leu Pro Ile

Phe Gly Phe Arg Asp Ser Phe Ile Tyr Lys Glu Leu Trp Thr Asp Glu

235

20

10 Leu Lys Ile Ala Ser Lys Asp Ile Leu Glu Gln Thr Ala Leu Ser Thr 25 Ser Phe Gly Asn Ser Ser Ala Thr Val Asp Ala Ile Gly Ile Asn Val Tyr Asp Pro Ala Phe Pro Leu Ile Thr Pro Ser Leu Ile His Ser Val 55 Phe Thr Met <210> 5539 <211> 254 <212> PRT <213> B.fragilis <400> 5539 Val Leu Arg Glu Ala Ile Pro Ala Ala Leu Ser Ile Pro Gly Arg Glu Gly Tyr Pro Val Tyr Ala Ile Phe Ala Ile Lys Thr Ala Gly Leu Asp Glu Glu Gly Tyr Pro Leu Phe Tyr Asp Lys Glu Gly Lys Lys Val Thr 40 Leu Lys Glu Leu Tyr Arg Trp Gln Asp Pro Phe Gly Leu Gly Phe Thr Val Asn Ser Asp Val Thr Pro Ala Glu Glu Arg Ser Phe Tyr Ser Tyr Ile Gly Ser Gln Asp Thr Pro Tyr Thr Gly Gly Leu Ile Asn Thr Phe 90 Ser Tyr Lys Asn Trp Glu Leu Thr Ala Asn Leu Ser Phe Asn Leu Gly 105 Gly Tyr Val Arg Thr Thr Pro Ser Tyr Asn Phe Ile Asn Phe Asp Arg 125 120 Gly Gln Asn Val Asn Ser Asp Ile Leu Asp Arg Trp Thr Pro Glu Asn 140 135 Thr Asp Gly Arg Leu Pro Ala Leu Ile Thr Ser Glu Lys Arg Ala Asp 155 150 Glu Tyr Tyr Trp Tyr Asp Gln Lys Ser Glu Ile Tyr Lys Asn Leu Asp 170 165 Ile Trp Val Lys Lys Leu Asn Tyr Phe Arg Leu Gln Asn Leu Arg Leu 190 185 Gly Tyr Arg Leu Pro Glu Lys Met Thr Lys Ser Leu Gly Met Gly Ser 200 Ala Ser Val Ala Ile Glu Gly Arg Asn Leu Leu Val Phe Gly Ser Ser 220 215 Tyr Lys Asn Phe Leu Asp Pro Glu Ser Met Tyr Asn Pro Tyr Ala Pro 230 235 Pro Ile Pro Lys Ser Ile Thr Phe Ser Leu Asn Leu Asn Phe 250 245 <210> 5540 <211> 349 <212> PRT <213> B.fragilis <400> 5540 His Leu Arg Glu Glu Ser Leu Ser Phe Ala Trp Tyr Leu Lys Arg Glu 10 Lys Ala Met Tyr Lys Gln Thr Ile Arg Pro Val Leu Phe Leu Met Glu Pro Glu Lys Val His Ala Leu Leu Val Ser Cys Leu Lys Cys Tyr Arg 40 His Leu Pro Trp Cys Arg Cys Trp Ile Arg His Leu Tyr Thr Cys Ser 55 Asp Lys Gln Leu Ile Trp Asn His Leu Thr Phe Arg Asn Arg Ile Gly Leu Ser Ala Gly Phe Asp Lys Gly Ala Glu Ile Phe Asp Glu Leu Ala 90 Asp Cys Gly Phe Gly Phe Ile Glu Val Gly Thr Val Thr Pro Asp Ser 105 Gln Asp Gly Asn Pro Arg Pro Arg Ile Phe Arg Leu Pro Gln Cys Glu 125 120 Ser Leu Ile Ser Arg Thr Gly Phe Asn Asn Pro Gly Leu Asp Val Ile 140 135 Lys Arg Arg Leu Glu Gln Lys Ser Gly Ser Tyr Val Leu Gly Val Asn 155 150 Ile Asn Lys Asn Pro Ser Ser Glu Gly Glu Gln Ala Val Ala Asp Phe 170 165 Leu Arg Leu Tyr Lys Glu Leu His Pro His Val Gly Tyr Phe Thr Leu 185 Asn Trp Gly Ser Val Asp Val Ala Leu Met Lys Gln Val Leu Gln Gly 200 Leu Ala Ala Phe Arg Val Glu Gln Asn Ile His Val Pro Leu Leu 215 Lys Leu Pro Ala Asp Ile Thr Glu Glu Gly Met Asp Asp Val Ile Asp 235 230 Cys Thr Arg Leu Tyr Arg Val Asp Gly Val Ile Ala Thr Gly Pro Thr 250 245 Met Glu Arg Ser Tyr Leu Lys Gly Tyr Ser Pro Ala Gln Leu Gln Lys 265 260 Ile Gly Ser Gly Gly Ile Ser Gly Arg Gly Ile Gly Glu Arg Ser Leu 285 280 Lys Ala Val Ser Tyr Leu Arg Ala His Ala Gly Lys Ser Leu Leu Ile 300 295 Val Gly Ala Gly Gly Ile Ile Thr Pro Ala Asp Ala Arg Arg Met Leu 315 310 Asp Ala Gly Ala Asn Leu Ile Gln Ile Tyr Ser Ser Phe Ile Tyr Glu 325 330 Gly Pro Gly Ile Val Lys Lys Met Ile Gln Glu Ile Lys

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<213> B.fragilis

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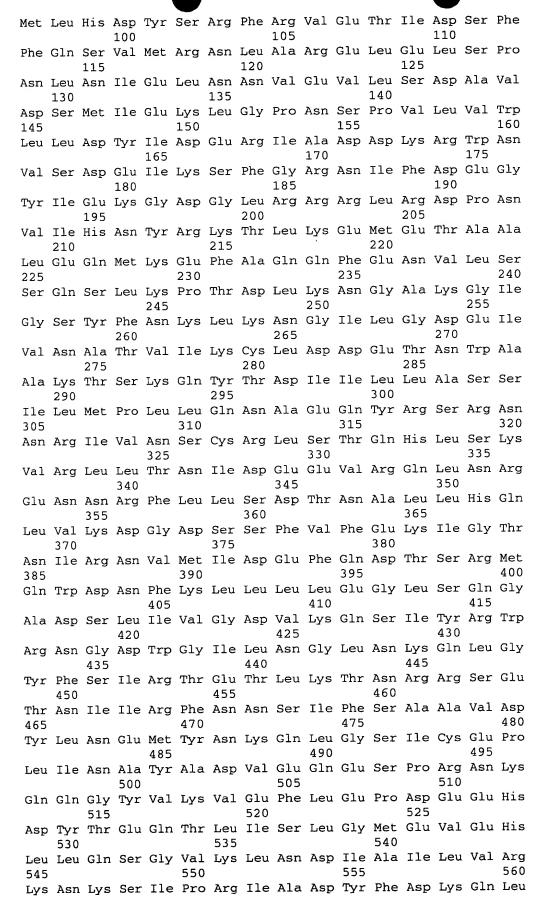
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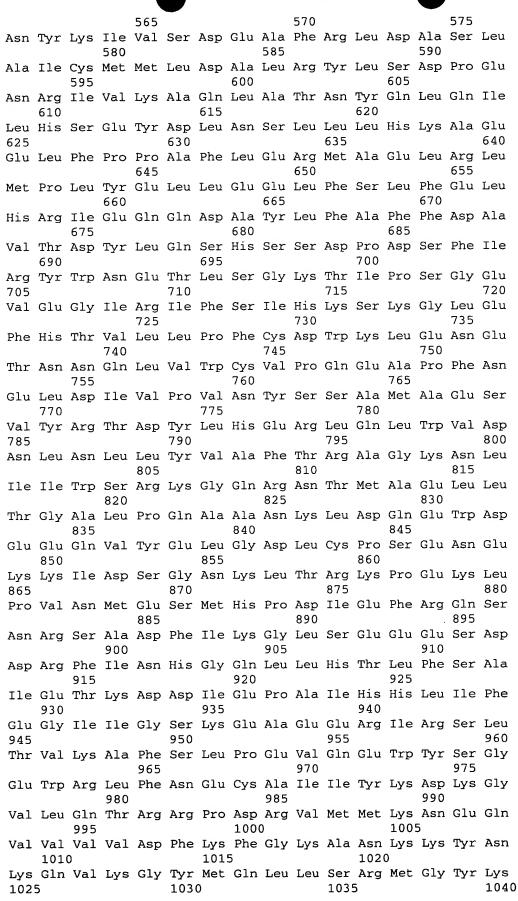
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2328

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Val

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<213> B.fragilis

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Leu Cys Leu Thr Asp Ser Leu Leu Lys Ile Val Ser Val Asp Thr Val 35 40 45

His Leu His Asp Val Ala Asp Glu Leu Thr Leu Asn Gly Arg Val Thr 50 55 60

Phe Asn Gln Glu Gln Val Ala His Val Tyr Pro Met Phe Gly Gly Thr 65 70 75 80

Val Thr Glu Leu Arg Ala Glu Val Gly Asp Tyr Val Arg Lys Gly Asp
85
90
95

Ile Leu Ala Ile Leu Arg Ser Gly Glu Val Ala Asp Tyr Glu Arg Gln
100 105 110

Met Lys Glu Ala Glu Gln Gln Val Ile Ile Ala Arg Arg Asn Val Asn 115 120 125

Ala Thr Arg Asp Met Phe Asp Ser Gly Leu Ala Ser Asp Lys Asp Val 130 135 140

Leu Gln Ala Arg Gln Glu Leu Ile Asn Ala Glu Ala Glu Glu Asn Arg 145 150 155 160

Glu Val Lys Ser Pro Val Ser Gly Phe Ile Val Glu Lys Ser Val Ser 180 185 190

Arg Asn Met Gln Leu Arg Pro Asp Gln Gly Glu Glu Ile Phe Thr Val 195 200 205

Ser Gly Leu Glu His Val Trp Val Met Ala Asp Val Tyr Glu Ser Asp 210 215 220

Ile Ser Lys Val Ala Glu Gly Ala Ser Val His Ile Thr Thr Leu Ala 225 230 235 240

Tyr Pro Gly Lys Val Phe Ser Gly Asn Ile Asp Lys Val Tyr His Met 245 250 255

Leu Asn Thr Glu Ser Lys Thr Met Asn Val Arg Val Lys Leu Cys Asn 260 265 270

Glu Asp Tyr Leu Leu Lys Pro Gly Met Phe Thr Thr Val Asn Val Glu 275 280 285

Cys Lys Ser Ser Gly Lys Gln Met Pro Arg Ile Asn Ala His Ala Leu 290 295 300

Ile Phe Glu Gly Gly Lys Asn Tyr Val Val Thr Val Thr Pro Asp Asn 305 310 315 320

Arg Leu Lys Val Lys Glu Val Asp Val Tyr Lys Arg Gln Asn Gln Glu 325 330 335

Cys Tyr Val Arg Ser Gly Leu Ser Glu Gly Asp Arg Val Leu Asn Gln 340 345 350

Asn Val Leu Leu Val Tyr Asn Ser Leu Asn Ala Asp 355 360 <211> 208 <212> PRT

<213> B.fragilis

<400> 5543

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Asp Glu Asp Arg Ala Arg Gln Phe Pro Leu His Gln Lys Thr Tyr Lys 35 40 45

Glu Asn Ala Tyr Val Ser Phe Phe Ser Thr Ala Ser Tyr Ser Leu Met 50 55 60

Asn Arg Tyr Thr Phe Gly Gly Ser Ile Arg Phe Asp Gly Ser Asp Leu
65 70 75 80

Phe Gly Val Asp Lys Lys Tyr Arg Tyr Leu Pro Leu Tyr Ser Val Ser 85 90 95

Gly Leu Trp Arg Leu Ser Asn Glu Pro Phe Met Gln Gly Thr Arg Lys
100 105 110

Trp Met Asp Asn Leu Ala Phe Arg Val Ser Tyr Gly Ile Gln Gly Asn 115 120 125

Ile Asp Lys Asn Thr Ser Pro Phe Leu Leu Gly Lys Tyr Ile Val Asp 130 135 140

Asn Ile Leu Pro Gly Gly Ser Glu His Met Ile Asp Ile Asn Ser Ala 145 150 155 160

Pro Asn Lys Lys Leu Arg Trp Glu Lys Thr Gln Ser Val Asn Val Gly 165 170 175

Leu Asp Phe Ser Val Leu Asn Gln Ala Leu Asn Leu Ser Val Asp Tyr
180 185 190

Tyr Tyr Arg Lys Gly Thr Asp Leu Phe Arg Ser Ser Asn Asp Ser Thr
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<211> 857

<212> PRT

<213> B.fragilis

<400> 5544

Thr Tyr Gly Trp Gln His Pro Lys Arg Val Gln Thr Ser Gln Ser Phe
1 5 10 15

Cys Leu Asn Trp Tyr Arg His Ser Met Leu Gln Asp Lys Leu Ser Ala 20 25 30

Pro Arg His Gln Glu Pro Lys Cys Leu Phe Leu Gln Met Arg Gln His  $35 \hspace{1cm} 40 \hspace{1cm} 45 \hspace{1cm}$ 

Leu Thr Ser Asn Lys Glu Ser Leu Phe Gly Ser Lys Pro Thr Ala Gln 50 55 60

Arg Phe Val Leu Pro Lys Cys Pro Phe Trp Gln Ala Ile Leu Cys Leu 65 70 75 80

Gln Val Leu Ser Tyr Tyr Leu Ile Leu Leu Ile His Ala Gln Lys Tyr
85 90 95

Lys Lys Arg Lys Arg Thr Pro Tyr Lys Thr Arg Lys Lys Thr Ile Phe 100 105 110

Thr Asp Asp Lys Phe Glu Leu Leu Met Glu Arg Asp Glu Phe Phe Thr
115 120 125

Lys Glu Glu Arg Glu Leu Leu Phe Ser Leu Tyr Lys Lys Leu Leu Arg 130 135 140

Leu Thr Gly Glu Thr Leu Gln Lys Gly Asp Cys Arg Lys Leu Lys Lys 145 150 155 160
His Leu Ile Asp Ser Thr Gln Asn Asn Thr Met Gln Arg Asp Ser Phe

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THE COLD IN CO
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1

				165					170					175	
Gly	Leu	Asn	Pro 180		Ile	Lys	Asp	Met 185		Thr	Ala	Val	Ile 190		Ala
Glu	Glu	Ile 195	Gly	Met	Lys	Arg	Ala 200	Ser	Ile	Leu	Gly	Ile 205	Met	Leu	His
Thr	Pro 210	Val	Arg	Cys	His	Ser 215	Tyr	Thr	Ile	Glu	Tyr 220	Ile	Gln	Gln	Glu
Tyr 225	Gly	Glu	Asp	Val	Ala 230	Gly	Ile	Ile	Arg	Gly 235	Leu	Ile	Lys	Ile	Asn 240
Asp	Leu	Tyr	Asp	Lys 245	Ser	Pro	Thr	Ile	Glu 250	Ser	Glu	Asn	Phe	Arg 255	Asn
Leu	Leu	Leu	Ser 260	Phe	Ala	Glu	Asp	Met 265	Arg	Val	Ile	Leu	Ile 270	Met	Ile
Ala	Asp	Arg 275	Val	Asn	Val	Met	Arg 280	Gln	Ile	Lys	Asp	Ala 285	Glu	Asn	Asp
Glu	Ala 290	Arg	Arg	Arg	Val	Ala 295	Asn	Glu	Ala	Ala	Tyr 300	Leu	Tyr	Ala	Pro
305					310					315		Glu			320
				325					330			His		335	
			340					345				Ile	350		
		355					360				_	Leu 365			
	370					375					380	Gln			_
385					390					395		Phe			400
				405					410			Glu -	_	415	
			420					425				Pro	430		
		435					440					Glu 445			
	450					455					460	Val			
465					470					475		Ala			480
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			500					505				Leu	510		
		515					520		_			Phe 525			
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545					550					555		Cys			560
				565					570			Leu		575	
			580					585				Pro	590		_
		595					600					Lys 605			
	610					615					620	Ala			
625	GIU	wia	пλр	LIIG	630	ASII	ALG	υλρ	net	635	TÄT	Asp	GIU	ATG	640

Met Met Arg Leu Ile Lys Arg Leu Gly Phe Lys Asn Val Thr Glu Phe 645 650 Tyr Gln Lys Ile Ala Asp Glu Val Leu Asp Val Asn Asp Ile Leu Asp 665 Lys Tyr Ile Glu Gln Gln Lys Arg Asp Ser Glu Arg Asp Glu Val Thr 680 Tyr Arg Ser Ala Glu Glu Tyr Asn Leu Gln Asn Gln Ile Asp Glu Thr 695 Thr Val Thr Lys Glu Asp Val Leu Val Ile Asp Gln Asn Leu Lys Gly 710 Leu Asp Phe Lys Leu Ala Lys Cys Cys Asn Pro Ile Tyr Gly Asp Asp 730 725 Val Phe Gly Phe Val Thr Val Ser Gly Gly Ile Lys Ile His Arg Asn 745 Asp Cys Pro Asn Ala Gly Gln Met Arg Glu Arg Phe Gly Tyr Arg Ile 760 Val Lys Ala Arg Trp Ala Gly Lys Ser Glu Gly Thr Gln Tyr Pro Ile 775 Thr Leu Arg Val Val Gly His Asp Asp Ile Gly Ile Val Thr Asn Ile 795 790 Thr Ser Ile Ile Ser Lys Glu Asn Gly Ile Ser Leu Arg Ser Ile Gly 805 810 Ile Asp Ser Asn Asp Gly Leu Phe Ser Gly Thr Leu Thr Ile Met Val 825 Ser Asp Thr Gly Arg Leu Glu Ala Leu Ile Lys Lys Leu Arg Thr Val 840 Lys Gly Val Lys Gln Val Ser Arg Asn 855 <210> 5545 <211> 492 <212> PRT <213> B.fragilis <400> 5545 Tyr Ser Leu Leu Met Ile Phe Thr Ala Glu Asn Ile Leu Leu Ile Gly Ser Ile Leu Leu Phe Val Ser Ile Val Val Gly Lys Thr Gly Tyr Arg 25 Phe Gly Val Pro Ala Leu Leu Phe Leu Leu Val Gly Met Leu Phe 40 Gly Ser Asp Gly Leu Gly Leu Gln Phe His Asn Ala Lys Ile Ala Gln 55 Phe Ile Gly Met Val Ala Leu Ser Val Ile Leu Phe Ser Gly Gly Met 70 75 Asp Thr Lys Phe Lys Glu Ile Arg Pro Ile Leu Ser Pro Gly Ile Val 85 90 Leu Ser Thr Val Gly Val Phe Leu Thr Ala Leu Phe Thr Gly Leu Phe 105 110 Ile Trp Tyr Leu Ser Gly Met Ser Trp Thr Asn Ile His Phe Pro Leu 120 Ile Thr Ser Leu Leu Leu Ala Ser Thr Met Ser Ser Thr Asp Ser Ala 140 135 Ser Val Phe Ala Ile Leu Arg Ser Gln Lys Met Asn Leu Lys His Asn

150

165

180

Leu Arg Pro Met Leu Glu Leu Glu Ser Gly Ser Asn Asp Pro Met Ala

Tyr Met Leu Thr Ile Val Leu Ile Gln Phe Ile Gln Ser Asp Gly Met

155

170

2332

Gly Thr Gly Asn Ile Ile Gly Ser Phe Ile Ile Gln Phe Leu Val Gly 205 200 Ala Ala Ala Gly Tyr Ile Leu Gly Lys Leu Ala Ile Leu Ile Leu Asn 220 215 Lys Ile Asn Ile Asp Asn Gln Ser Leu Tyr Pro Ile Leu Leu Leu Ser 235 230 Phe Val Phe Phe Thr Phe Ala Ile Thr Asp Leu Leu Arg Gly Asn Gly 250 245 Tyr Leu Ala Val Tyr Ile Ala Gly Met Met Val Gly Asn His Lys Ile 265 Thr Phe Arg Lys Glu Ile Ala Thr Phe Met Asp Gly Leu Thr Trp Leu 280 Phe Gln Ile Ile Met Phe Leu Met Leu Gly Leu Leu Val Asn Pro His 300 295 Glu Met Ile Glu Val Ala Val Val Ala Leu Leu Ile Gly Val Phe Met 315 310 Ile Val Ile Gly Arg Pro Leu Ser Val Phe Leu Cys Leu Leu Pro Phe 330 325 Arg Lys Ile Thr Leu Lys Ser Arg Leu Phe Val Ser Trp Val Gly Leu 345 Arg Gly Ala Val Pro Ile Ile Phe Ala Thr Tyr Pro Val Val Ala Asn 360 Val Glu Gly Ser Asn Met Ile Phe Asn Ile Val Phe Phe Ile Thr Ile 380 375 Val Ser Leu Ile Val Gln Gly Thr Ser Val Ser Phe Val Ala Arg Leu 395 390 Leu His Leu Ser Thr Pro Leu Glu Lys Thr Gly Asn Asp Phe Gly Val 410 405 Glu Leu Pro Glu Glu Ile Asp Thr Asp Leu Ser Asp Met Thr Ile Thr 425 430 420 Met Glu Met Leu Asn Glu Ala Asp Thr Leu Lys Asp Met Asn Leu Pro 445 440 Lys Gly Thr Leu Val Met Ile Val Lys Arg Gly Asp Glu Phe Leu Ile 460 455 Pro Asn Gly Thr Leu Lys Leu His Val Gly Asp Lys Leu Leu Leu Ile 475 470 Ser Glu Lys Asn Lys Gln Glu Thr Val Lys Asn Glu

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<213> B.fragilis

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Ile Asp Arg Val Glu Val Arg Thr Leu Phe Lys His Phe Leu Cys Phe 90 85

Arg Ile Ile His Ile Asp Leu

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Ser Ser Phe Ser Ser Gly Ile Arg Asn Leu Gln Arg Asn Gln Lys Asn
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Met Lys Gln Leu Arg Asn Ile Val Ala Gly Met Leu Val Leu Ile Gly
Gly Met Leu Pro Ala Thr Thr Phe Ala Gln Glu Pro Val Pro Gly Asp
Thr Thr Gly Thr Leu Gln His Glu Ile Ile Val Gly Lys Asp Thr Ile
                    70
Asn Gln Glu Ala Asn Gln Val Asp Val Lys Gly Ile Val Phe Gly Pro
                                     90
Ile Gly Asp Ser Tyr Glu Trp His Ile Thr Asn Ile Gly Lys Thr Ser
                                105
            100
Ile Cys Ile Pro Leu Arg Leu Ile Val Tyr Ser Glu Leu Ser Gly Trp
                            120
His Ala Phe Leu Ser Ser Arg Leu Glu Glu Asn Gly Gly Lys Tyr Glu
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                                             140
Gly Phe Tyr Ile Ala Pro Ala Gly Ser Lys Tyr Glu Gly Xaa Val Val
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Glu Arg Asn Ala Thr Gly Glu Glu Val Arg Pro Trp Asp Ile Ser Ile
                                     170
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Thr Lys Val Thr Leu Ser Leu Phe Ile Asn Ser Ala Ile Leu Leu Ala
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Ile Ile Leu Ser Val Ala His Trp Tyr Arg Lys Arg Glu Gln Gly Ala
Tyr Ala Pro Gly Gly Phe Ile Gly Phe Met Glu Met Phe Ile Met Met
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                        215
Val His Asp Asp Val Ile Lys Ser Cys Val Gly Pro Asn Tyr Lys Lys
                                         235
                    230
Phe Ala Pro Tyr Leu Leu Thr Ala Phe Phe Phe Ile Phe Ile Asn Asn
                245
                                     250
Ile Met Gly Leu Ile Pro Ile Phe Pro Gly Gly Ala Asn Val Thr Gly
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            260
Asn Ile Ala Ile Thr Leu Val Leu Ala Leu Phe Thr Phe Val Ile Val
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                             280
Asn Ile Phe Gly Thr Lys His Tyr Trp Lys Asp Ile Phe Trp Pro Asp
                                             300
                         295
Val Pro Trp Trp Leu Lys Val Pro Ile Pro Met Met Pro Phe Ile Glu
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                     310
Phe Phe Gly Val Phe Thr Lys Pro Phe Ala Leu Met Ile Arg Leu Phe
                                     330
Ala Asn Met Leu Ser Gly His Met Ala Met Leu Val Leu Thr Cys Leu
                                 345
            340
Ile Phe Ile Ser Ala Ser Met Gly Pro Ala Ile Asn Gly Ser Leu Thr
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Val Ala Ser Val Leu Phe Asn Ile Phe Met Asn Leu Leu Glu Val Leu
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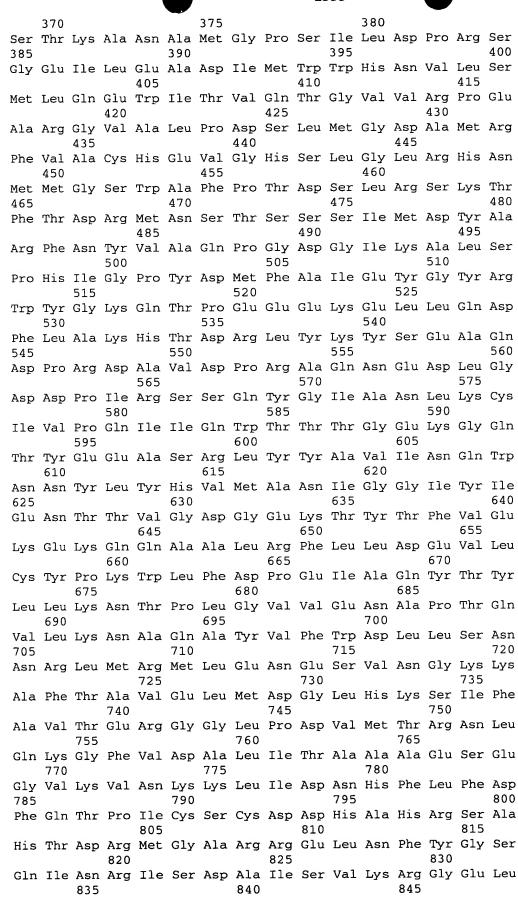
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Glu Val Asp Met Asp Asp Val Asn Tyr Ser Val Leu Thr Tyr Ala Ala



2336

Leu Leu Gln Ser Arg Leu Gly Thr Ser Asp

Leu Arg Ile Lys Asp Leu Leu Gln Ser Arg Leu Gly Thr Ser Asp Val 850 855 860 Ala Thr Lys Tyr His Tyr Lys Asp Leu Ile Leu Arg Ile Asn Thr Ala 865 870 875 880

Leu Gly Ile Ser Lys 885

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Leu Gly Leu Leu Val Gly Ile Leu Leu Phe Ala Arg Val Ala Phe Glu 35 40 45

Leu Asn Tyr Asp Ser Tyr Tyr Gln Glu Pro Glu Asn Leu Phe Leu Thr 50 55 60

Leu Arg Thr Val Val Ser Gln Gly Glu Lys Lys Glu Pro Val Cys Ser 65 70 75 80

Asn Tyr Gly Lys Leu Pro Ala Ala Ile Arg Glu Asn Phe Pro Asp Glu 85 90 95

Val Glu Asp Ala Thr Leu Ile Asp Leu Phe Ser Arg Ser Ser Leu Tyr 100 105 110

His Glu Gly Gln Glu Lys Lys Asp Ala Ile Leu Ala Thr Ser Arg Ser 115 120 125

His Ile Phe Ser Thr Leu Gly Val Lys Val Leu Ser Gly Asn Val Ser 130 135 140

Glu Leu Asp Asn Met Asp Ala Leu Phe Ile Ser Arg Ser Leu Ala Gln 145 150 155 160

Ser Leu Phe Ala Asp Ala Asp Pro Ile Gly Lys Thr Val Met Ile Asn
165
170
175

Ile Asp Tyr Pro Leu Thr Val Arg Gly Val Phe Glu Asp Ile Pro Glu
180 185 190

Asn Ala Glu Phe Arg Phe Asp Gly Val Tyr Ser Phe Val Thr Arg Ala
195 200 205

Asn Arg Phe Arg Asp Glu Arg Gly Gly Trp Arg Gly Asp Ile Ser Tyr 210 215 220

Thr Cys Met Val Arg Phe Arg His Pro Glu Asp Val Glu Lys Val Ala 225 230 235 240

Ala Arg Met Pro Asp Met Leu Lys Lys Tyr Ile Gln Tyr Asn Lys Asp
245 250 255

Trp Phe Glu Glu Phe Ser Phe Ile Thr Pro Ser Gln Phe His Leu Gln 260 265 270

Lys Lys Glu Ser Arg Lys Ile Ile Ser Ile Leu Ser Ile Leu Gly Phe 275 280 285

Ala Ile Leu Leu Ile Ala Gly Met Asn Asn Val Leu Asp Phe Tyr Phe 290 295 300

Ile Ile Gly Ser Thr Ser 305 310

<210> 5550

<211> 132

<212> PRT

<213> B.fragilis

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Arg Ala Ser Val Ala Leu Ser Gly Leu Thr Val Ala Glu Ser Phe Arg

270 265 260 Asp Met Gly Ala Lys Ser Gly Ala Arg Asp Ile Leu Phe Phe Ile Asp 285 280 Asn Ile Phe Arg Phe Thr Gln Ala Gly Ser Glu Val Ser Ala Leu Leu 295 Gly Arg Met Pro Ser Ala Val Gly Tyr Gln Pro Thr Leu Ala Thr Glu 310 315 Met Gly Ala Met Gln Glu Arg Ile Thr Ser Thr Lys Thr Gly Ser Ile 325 330 Thr Ser Val Gln Ala Val Tyr Val Pro Ala Asp Asp Leu Thr Asp Pro 345 Ala Pro Ala Thr Thr Phe Thr His Leu Asp Ala Thr Thr Val Leu Ser 360 Arg Lys Ile Thr Glu Leu Gly Ile Tyr Pro Ala Val Asp Pro Leu Glu 380 375 Ser Thr Ser Arg Ile Leu Asp Pro His Ile Val Gly Gln Glu His Tyr 390 395 Asp Val Ala Gln Arg Val Lys Gln Ile Leu Gln Arg Asn Lys Glu Leu 410 405 Gln Asp Ile Ile Ser Ile Leu Gly Met Glu Glu Leu Ser Asp Ala Asp 425 420 Arg Leu Val Val Asn Arg Ala Arg Arg Val Gln Arg Phe Leu Ser Gln 440 Pro Phe Thr Val Ala Glu Gln Phe Thr Gly Val Pro Gly Ala Met Val 455 Ala Ile Glu Asp Thr Ile Lys Gly Phe Lys Met Ile Leu Asp Gly Glu 475 470 Val Asp Tyr Leu Pro Glu Pro Ala Phe Leu Asn Val Gly Thr Ile Glu 490 485 Glu Ala Ile Glu Lys Gly Lys Lys Leu Leu Glu Gln Ala Asn Lys 505 500 <210> 5552 <211> 602 <212> PRT <213> B.fragilis <400> 5552 Gln Met Lys Arg His Val Phe Ile Leu Leu Leu Ser Phe Ala Gly Val 10 Leu Thr Ser Ala Phe Ala Ala Ser Arg Gln Val Gln Gly Val Val Ile 2.5 Ser Ser Glu Asp Asn Met Pro Leu Ile Gly Ala Ser Val Tyr Ile Lys 40 Ala Glu Asp Leu Ser Lys Asp Gly Asn Ser Pro Thr Ile Thr Gly Val 55 Ile Thr Asp Ile Asp Gly Lys Phe Asn Ile Ser Val Pro Glu Gly Val

70 75 Thr Arg Leu Phe Cys Ser Tyr Val Gly His Glu Val Gln Glu Leu Lys 90 85 Leu Val Pro Gly Lys Asp Gln Tyr Glu Ile Thr Leu Phe Pro Ser Ala 105 Gln Met Leu Asp Ala Val Val Thr Gly Tyr Gln Thr Val Glu Arg 120 Arg Lys Leu Thr Ala Ala Val Gly Lys Leu Asn Ile Ser Asp Glu Thr 140 135 Ile Gly Ala Val Lys Ser Ile Asp Gln Ala Leu Ala Gly Gln Ile Ala 150 155 Gly Leu Ser Val Thr Ser Thr Ser Gly Ala Pro Gly Ala Pro Ala Lys

														·	
				165					170					175	
Ile	Arg	Ile	Arg 180	Gly	Thr	Ser	Ser	Leu 185	Asn	Gly	Thr	Gln	Asp 190	Pro	Leu
Trp	Val	Leu 195	Asp	Gly	Ile	Pro	Leu 200	Glu	Gly	Thr	Asp	Val 205	Pro	Gln	Ser
Asn	Val 210	Leu	Asn	Asp	Val	Ser 215	Asn	Ile	Gln	Gln	Ser 220	Ser	Ile	Ala	Gly
Leu 225	Asn	Pro	Ala	Asp	Ile 230	Glu	Asn	Ile	Thr	Val 235	Leu	Lys	Asp	Ala	Ala 240
Ala	Thr	Ala	Ile	Tyr 245	Gly	Ala	Arg	Ala	Ala 250	Asn	Gly	Val	Ile	Val 255	Ile
Thr	Thr	Lys	Lys 260	Gly	Lys	Val	Gly	Lys 265	Pro	Val	Ile	Asn	Phe 270	Ser	Ser
Lys	Phe	Thr 275	Tyr	Met	Pro	Thr	Leu 280	Ser	Thr	Asn	Arg	Leu 285	Asn	Met	Leu
	290					295					300	Leu			
Phe 305	Ala	Tyr	Gly	Asp	Asn 310	Lys	Gly	Gly	Val	Ser 315	Lys	Ile	Ile	Ser	Gly 320
_	_			325			_	_	330			Ser		335	
			340					345				Thr	350		
		355					360					Glu 365			
	370		_	_		375	_				380	Thr			
385	_				390					395		Leu			400
				405			_		410			Met		415	
_			420					425				Thr	430		
_		435	_				440					Arg 445			
	450					455					460	Val			
465					470	_		_		475		Asn			480
				485					490			Ala		495	
			500					505				Lys	510		
		515					520					Gln 525			
_	530					535					540	Ser			
545					550					555		Asp			560
				565					570			Trp		575	
			580					585	_	HIS	Glu	Leu	G1u 590	val	met
val	GTÀ	Thr 595	GIU	ьеи	arg	ьys	H1S	Leu	val						

<210> 5553 <211> 530 <212> PRT

## <213> B.fragilis

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Pro Val Asp Leu Val Cys Ala Val Arg Asp Tyr Lys Gly His Lys Phe 455 Asp Leu Ala Lys Tyr Val Asp Lys Ala Thr Gly Phe Ile Ser Tyr Lys 475 470 Ser Lys Ser Gly Lys Asp Leu Lys Ala Leu Glu Leu Pro Gly Leu Trp 490 485 Asn Gly Ala Met Ser Asp Trp Ser Thr Val Phe Val Glu Val Pro Leu 505 Ser Thr Phe Asn Pro Val Lys Thr Val Asn Asp Leu Leu Arg Glu Gln 520 His Gln 530 <210> 5554 <211> 864 <212> PRT <213> B.fragilis <400> 5554 Leu Ile Ile Leu Leu Ser Ser Phe Phe Cys Phe Asn Phe Val Ala Lys Tyr Tyr Cys Met Glu Glu Asn His Glu Ile Glu Leu Ala Trp Gln 25 20 Val Ile Glu Asn Thr Gly Thr His Leu Phe Leu Thr Gly Lys Ala Gly 40 Thr Gly Lys Thr Thr Phe Leu Arg Arg Leu Lys Glu Leu Thr Pro Lys 55 Arg Met Val Val Ala Pro Thr Gly Ile Ala Ala Ile Asn Ala Gly 70 75 Gly Val Thr Ile His Ser Phe Phe Gln Leu Asn Phe Ala Pro Tyr Ile 90 85 Pro Glu Ser Thr Phe Asn Ser Ala Gln Gln Gly Phe His Lys Phe Gly 105 Lys Glu Lys Ile Asn Ile Ile Arg Ser Met Asp Leu Leu Val Ile Asp 120 115 Glu Ile Ser Met Val Arg Ala Asp Gln Leu Asp Ala Ile Asp Ala Val 140 135 Leu Arg Arg Tyr Arg Asp Arg Ser Lys Pro Phe Gly Gly Val Gln Leu 155 150 Leu Met Ile Gly Asp Leu Gln Gln Leu Ala Pro Val Val Lys Glu Glu 170 165 Asp Trp Ser Leu Leu Ser Ser Tyr Tyr Asp Thr Ala Phe Phe Gly 185 Ser His Ser Leu Lys Glu Thr Glu Tyr Ile Thr Ile Glu Leu Lys Lys 200 205 Val Tyr Arg Gln Ser Asp Thr Glu Phe Val Gly Leu Leu Asn Lys Ile 215 220 Arg Glu Lys Glu Ala Asp Asp Ala Val Leu Glu Glu Leu Asn Lys Arg 235 230 Tyr Leu Pro Gly Phe Arg Pro Arg Glu Glu Glu Gly Tyr Ile Arg Leu 245 250 Thr Thr His Asn Tyr Gln Ala Gln Gln Tyr Asn Asp Arg Gln Leu Leu 265 260 Ser Leu Ser Gly Arg Ala Phe Ser Phe Gln Ala Lys Val Glu Gly Thr 280 275 Phe Pro Glu Ser Ala Tyr Pro Ala Asp Glu Met Leu Thr Val Lys Glu 295 300 Gly Ala Gln Ile Met Phe Ile Lys Asn Asp Ser Ser Gly Glu His Arg 310 315 305

Tyr Tyr Asn Gly Met Ile Gly Leu Val Thr Ala Val Ser Lys Asp Gly 330 325 Ile Arg Val Lys Gly Asn Gly Glu Ser Gln Asp Phe Leu Leu Glu Thr 345 Glu Glu Trp Thr Asn Ser Lys Tyr Ser Leu Asn Pro Gln Thr Lys Glu 360 Ile Thr Glu Glu Val Glu Gly Thr Phe Arg Gln Tyr Pro Ile Arg Leu 380 375 Ala Trp Ala Ile Thr Ile His Lys Ser Gln Gly Leu Thr Phe Glu Arg 395 390 Ala Ile Ile Asp Ala Asn Ala Ser Phe Ala His Gly Gln Val Tyr Val 405 410 Ala Leu Ser Arg Cys Lys Ser Leu Gln Gly Leu Val Leu Ser Ser Pro 425 420 Leu Arg Arg Glu Ser Ile Ile Ser Asp Asp Thr Ile Asp Glu Phe Thr 435 440 Arg Asn Ala Gly Glu Met Thr Pro Asp Lys His Lys Leu Ala Leu Leu 455 Arg Gln His Tyr Phe Tyr Glu Leu Leu Cys Glu Gln Phe Asp Phe His 475 470 Pro Ile Glu Gln His Phe Leu Arg Leu Leu Arg Leu Leu Asp Glu His 490 485 Leu Tyr Arg Leu Tyr Pro Lys Leu Leu Glu Arg Tyr Lys Thr Thr Ala 505 Asp Leu Tyr Lys Thr Gln Ile Met Lys Val Ala Asp Thr Phe Lys Leu 520 515 Gln Tyr Ser Ala Leu Leu Met Glu Ala Glu Asp Tyr Thr Ala Asn Pro 540 535 Lys Leu Asn Glu Arg Val Met Ala Gly Ala His Tyr Phe Arg Gln His 555 550 Leu Glu Asp Leu Leu Thr Pro Leu Ile Thr Ser Thr Lys Val Glu Thr 570 565 Asp Asn Lys Glu Leu Lys Lys Lys Phe Ser Glu Ala Ala Asp Ala Met 585 580 Lys Thr Ala Leu His Val Lys Leu Gly Thr Leu Cys Tyr Thr Glu Lys 600 Glu Gly Phe Ser Val Ser Ala Phe Leu Lys Gln Lys Ala Val Leu Thr 615 Leu Ser Val Ser Gly Gly Glu Ala Ala Ser Ser Gly Arg Ser Glu 635 630 Arg Lys Ser Arg Thr Ala Glu Lys Ile Glu Val Pro Thr Asp Ile Leu 645 650 His Pro Glu Leu Tyr Lys Gln Leu Ile Ala Trp Arg Asn Ser Glu Ala 665 Ala Lys Ala Gly Leu Pro Val Tyr Thr Ile Ile Gln Gln Lys Ala Ile 680 Leu Gly Ile Val Asn Leu Leu Pro Asn Asp Ala Ala Ser Leu Ile Arg 700 695 Ile Pro Tyr Phe Gly Lys Arg Gly Ala Glu Lys Tyr Gly Asp Ala Leu 715 710 Leu Glu Met Val Asn Arg Tyr Val Glu Glu His Gly Ile Glu Arg Pro 730 725 Gln Met Pro Thr Ala Thr Leu Thr Val Asn Asn Gly Ile Lys Thr Ser 745 Lys Glu Pro Lys Pro Leu Lys Glu Ala Lys Ser Val Lys Glu Pro Lys 760 Pro Asp Thr Lys Glu Val Thr Tyr Arg Leu Phe Arg Gln Gly Lys Ser 780 775 Ile Glu Glu Ile Ala Arg Glu Arg Glu Leu Val Ser Gly Thr Ile Ala

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Ile Ser Gly Ala Ser Ala Ala Ala Val Phe Tyr Gly Val Met Thr Val

115

Asp Gln Val Leu Leu Gly Asp Val Cys Ser Ser Asn Arg Lys Glu Met

130

135

140

Thr Pro Ile Ser Ile Asp Asp Ala Pro Arg Phe Gly Tyr Arg Ala Leu 145 150 155 160

Met Leu Asp Pro Ala Arg His Phe Leu Pro Ile Glu Asp Val Lys Phe
165 170 175

Tyr Ile Asp Gln Met Val Arg Tyr Lys Tyr Asn Val Leu Gln Leu His 180 185 190

Leu Thr Asp Asp Gln Gly Trp Arg Ile Glu Ile Arg Lys His Pro Lys

195
200
205
205

Leu Thr Ala Gly Gln Ser Phe Tyr Thr Gln Glu Glu Leu Ala Asp Leu 210 215 220

Ile Arg Tyr Ala Ala Glu Arg His Val Glu Ile Val Pro Glu Leu Asp

225 230 235 240

Ile Pro Gly His Thr Val Ala Val Leu Ala Ala Tyr Pro Glu Leu Gly

245 250 255

Cys Thr His Thr Asp Thr Ile Ala Lys Asn Val Gly Glu Thr Val Asn 260 265 270

Leu Met Leu Cys Ala Asn Asn Glu Lys Val Tyr Glu Val Tyr Asn Asp

Ile Ile Asp Glu Val Ser Ala Leu Phe Pro Ser Arg Tyr Ile His Leu
290 295 300

Gly Gly Asp Glu Ala Val Ile Glu Lys Asn Trp Thr Lys Cys Glu Arg 305 310 315 320 Cys Gln Lys Met Met Lys Glu Leu Lys Tyr Glu Lys Ala Ser Gln Leu

325 330 335

Met Ile Pro Phe Phe Ser Arg Met Leu Ser Phe Val Glu Ala Asp Gly

345 Lys Tyr Pro Ile Leu Trp Cys Glu Leu Asp Asn Ile Arg Met Pro Ala 360 Asn Asp Tyr Leu Phe Pro Tyr Pro Lys Asn Val Thr Leu Val Ser Trp 380 375 Arg Tyr Gly Leu Thr Pro Thr Cys Gln Lys Leu Thr Gln Gln His Gly 395 390 Asn Pro Leu Ile Met Ala Pro Gly Glu Phe Ala Tyr Leu Asp Tyr Pro 410 405 Gln Phe Lys Gly Asp Leu Pro Glu Phe Asn Asn Trp Gly Met Pro Val 420 425 Thr Thr Leu Glu Thr Cys Tyr Gln Phe Asp Pro Gly Tyr Gly Lys Pro 440 Ala Ala Glu Gln Ala His Ile Leu Gly Val Met Gly Thr Leu Trp Gly 460 455 Glu Ala Ile Lys Asp Ile Asn Arg Val Thr Tyr Met Thr Tyr Pro Arg 470 475 Gly Leu Ala Leu Ala Glu Ala Gly Trp Thr Gln Met Glu His Arg Asn 490 485 Trp Asp Ser Phe Lys Glu Arg Leu Tyr Pro Asn Leu Asn Asn Leu Met 505 Lys Lys Gly Val Ser Ile Arg Val Pro Phe Glu Ile Val Lys Arg Lys 520

<210> 5556 <211> 315 <212> PRT <213> B.fragilis

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195 200 205
Gly Glu Gln Thr Arg Ser Phe Gln Tyr Ile Asp Asp Leu Val Glu Gly

Met Ile Arg Met Met Asn Thr Gly Asp Asp Phe Ile Gly Pro Ile Asn

220

215

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TU
13
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235 230 Leu Gly Asn Pro Asn Glu Phe Ser Met Leu Gln Leu Ala Glu Lys Ile 250 245 Ile Gln Lys Thr Gly Ser Lys Ser Lys Ile Thr Phe Lys Pro Leu Pro 265 His Asp Asp Pro Gln Gln Arg Lys Pro Asp Ile Arg Leu Ala Gln Glu 280 Lys Leu Gly Trp Gln Pro Thr Ile Leu Leu Asp Glu Gly Leu Asp Arg 295 Met Ile Asp Tyr Phe Lys Met Lys Tyr Lys Leu 310 <210> 5557 <211> 124 <212> PRT <213> B.fragilis <400> 5557 Phe Cys Asp Ile Ser Arg Lys Ala Cys Phe Leu Cys Gln Thr Pro Lys Ala Ile Thr Met Asp Leu Glu Lys Val Leu Ile Arg Glu Ile Asn Asn Asp Ser Arg Ile Phe Leu Tyr Lys Glu Gly Asp Cys Trp Ser Ala His Asp Asn Ser Ala Arg His Leu Cys Phe Leu Tyr Ser Gln Phe Asn Ala 55 Tyr Asp Arg Ile Tyr Gln Ala Tyr Glu Ile Val Leu Lys Cys Val Met 70 Leu Ser Asn Ala Met Ile Glu Lys Phe Ile Glu His Thr Leu Val Ser 85 90 Thr Val His Glu Asp Glu Ile Glu Ile Cys Ile Pro Lys Glu Lys Arg 105 100 Ala Glu Phe Glu Ser Trp Arg Ser Thr Ser Gly Val 120 115 <210> 5558 <211> 459 <212> PRT <213> B.fragilis <400> 5558 Leu Ile Arg Met Asp Trp Lys Ile Arg Asn Ile Arg Leu Gln Glu Leu 10 Arg Glu Ile Tyr Gln Glu Lys Leu Lys Asn Ile Ala Tyr Arg Val Tyr 25 Glu Ser His Phe Gln Asn Gly Ile Val Lys Gln Glu Glu Leu Glu Gly 40 Glu Ile Met Ser Tyr Tyr Gln His Thr Gln Pro Ser Leu Gln Glu Phe 55 60 Tyr Ser His Tyr Ala Thr Gln Trp Glu His Phe Tyr Glu Gly His Glu 70 75 Leu Thr Asp Ser Ala Phe Leu Arg Phe Leu Glu Asn Ser Ala Tyr Pro 85 90

Leu Gln Met Lys Tyr Asn Arg Gly Asp Leu Asn Leu Gln Tyr Tyr Ile 110 105 Asp Arg Phe His Thr Leu Lys Lys Arg Ser Lys Glu Trp Lys His Leu 120 Arg Asn Leu Phe Phe Asp Lys Trp Tyr His Leu Leu Ala Asn Asn Glu 135 130

Tyr Asn Tyr Gln Ile Glu Arg Ile Asn Asn Leu Cys Glu Arg Phe Tyr 155 150 Arg Leu Gln Lys Asn Ile Ala Asp Gln Leu Pro Gln Arg Gly Asn Ala 170 Arg Leu Met Trp Leu Leu Arg Thr His Gln Glu Leu Ala Lys Gln Leu 180 185 Phe His Tyr Asp Glu Ile Ala Lys Asn His Pro Ala Ile Arg Glu Leu 200 Thr Lys Ile Leu Gly Lys Gln His Tyr Gly Lys Glu Lys Lys Phe Arg 220 215 Met Val Ala Gly Ile His Arg Glu Gln Ile Ile Thr His Ala Thr Lys 235 230 Ser Asp Ile Thr Gly Val Cys Glu Gly Asn Asp Leu Asn Ser Leu Leu 250 245 Pro Ile Glu Tyr Cys Tyr Leu Ser Asp Pro Ala Leu Gln Pro Leu Phe 270 265 Phe Glu Arg Phe Asn Lys Lys Lys Leu Gln Met Met Asp Tyr Glu Ser 280 275 Lys Asp Gln His Arg Ile Lys Asp Ile Lys Ile Gln Gly Asn Glu Ile 295 Val Glu Glu Gln Ser Gly Pro Phe Ile Ile Cys Val Asp Thr Ser Gly 310 315 Ser Met Ser Gly Glu Arg Glu Glu Phe Val Lys Ser Ala Ile Leu Ala 330 Ile Ala Glu Leu Thr Glu Gln Gln Asp Arg Lys Cys Tyr Leu Ile Asn 345 340 Phe Ser Asn Asp Ile Ala Cys Ile Glu Ile Glu Arg Leu Gly Gln Asn 365 360 Ile Gln Glu Leu Ala Asn Phe Leu Cys Gln Ser Phe His Gly Gly Thr 375 Asp Leu Thr Pro Ala Leu Leu His Ala Ile His Ile Leu Lys Thr Lys 395 390 Ser Tyr Arg Asn Ala Asp Leu Val Met Met Ser Asp Phe Glu Met Pro 410 405 Pro Leu Asn Glu Glu Leu Ser Glu Glu Ile Lys Lys Ile Lys Gln Asn 425 Lys Thr His Leu Tyr Ala Leu Ser Val His Lys Gln Ser Glu Asn Thr 440 Tyr Leu Asn Val Cys Asn Lys Phe Trp Phe Val 455

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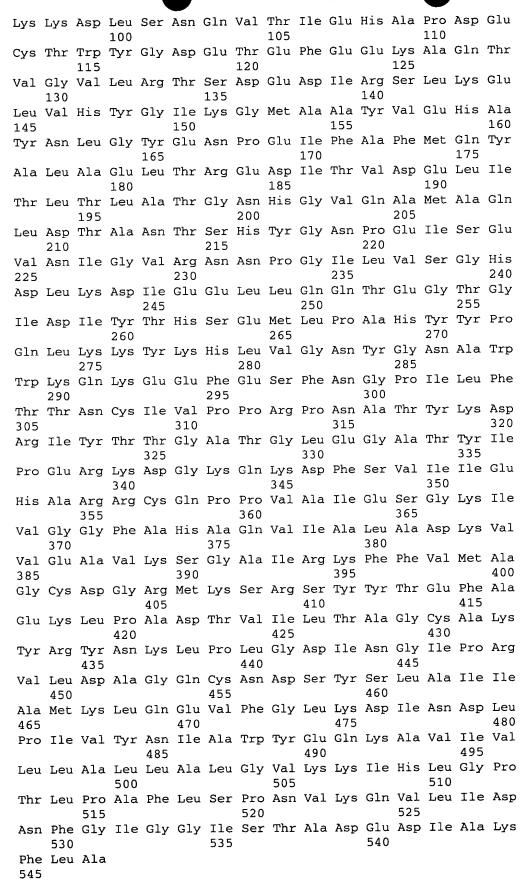
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Val Ala Asn Met Gln Asp Leu Leu Phe Val Val Arg Gly Ile Ala

Val Tyr Asn Gln Ala Leu Arg Lys Asp Gly Arg Ser Ser Ala Arg Ala 50 55 60

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Phe Asp Lys His Ser Ile Ile Glu Lys Ile Lys Lys Gly Leu Glu Leu



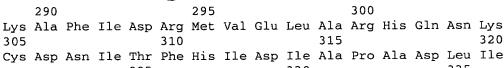
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Trp Met Leu Leu Ser Phe Gly Ile Val Phe Ala Val Leu Ala Lys Tyr
                                25
Gly Phe Pro Val Ile Ile Lys Met Val Glu Gly Arg Lys Thr Tyr Ile
                            40
Asp Glu Ser Leu Glu Val Ala Arg Glu Ala Asn Ala Gln Leu Ser Arg
                       55
Leu Lys Glu Glu Gly Glu Ala Ile Val Ala Ala Ala Asn Lys Glu Gln
                   70
                                        75
Gly Arg Ile Met Lys Glu Ala Met Gln Glu Arg Glu Lys Ile Ile Tyr
                                    90
                85
Glu Ala Arg Lys Gln Ala Glu Ile Ala Ala Gln Lys Glu Leu Asp Glu
                                105
            100
Val Lys Arg Gln Ile Gln Ile Glu Lys Asp Glu Ala Ile Arg Asp Ile
                            120
Arg Arg Gln Val Ala Leu Leu Ser Val Asp Ile Ala Glu Lys Val Ile
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Arg Lys Asn Leu Asp Asp Lys Gln Glu Gln Met Gly Met Ile Asp Arg
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                   150
Met Leu Asp Glu Val Leu Thr Lys Asn
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Leu Met Ala Tyr Ala Glu Glu Arg Gly Ala Glu Glu Arg Leu Tyr His
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Glu Leu Val Thr Leu Ala His Ser Phe Arg Thr Val Lys Gly Phe Cys
Ala Val Leu Asp Asn Pro Ile Val Ser Val Asn Glu Lys Phe Asn Leu
                        55
Ile Cys Thr Ala Ala Asp Gly Asp His Lys Pro Ser Glu Glu Phe Ile
                                        75
Arg Phe Ile Arg Leu Val Leu Lys Glu Arg Arg Glu Thr Tyr Leu Gln
                                    90
                85
Phe Met Ser Leu Met Tyr Leu Asp Leu Tyr Arg Lys Lys His Ile
                                105
Gly Val Gly Lys Leu Ile Thr Ala Val Pro Val Asp Lys Ala Thr Glu
                            120
Glu Arg Ile Arg Gln Thr Ala Ala His Ile Leu His Ala Tyr Met Glu
Leu Glu Thr Val Val Asp Pro Ser Ile Glu Gly Gly Phe Val Phe Asp
                                        155
                    150
Ile Asn Asp Tyr Arg Leu Asp Ala Ser Ile Ala Thr Gln Leu Lys Lys
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Val Lys Gln Gln Phe Ile Asp Lys Asn Arg Arg Ile Val
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2350
Val Gly Ile Val Phe Ala Tyr Ile Val Ser Asn Lys Trp Leu Glu Gln
                                425
Phe Ser Asp Arg Val Ser Val Asn Gly Gly His Phe Leu Val Val Ile
                            440
Ile Ile Ile Leu Leu Leu Ile Ile Gly Ser Val Ile Gly Arg Ser Trp
                       455
Asn Val Ala Asn Glu Asn Pro Val Asn Ser Ile Lys Asn Glu
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Met Tyr Val Gly Asn Leu Ser Tyr Asn Val Lys Glu Ser Asp Leu Arg
Gln Val Met Glu Glu Tyr Gly Val Val Glu Ser Val Lys Leu Ile Thr
Asp Arg Glu Thr Arg Arg Ser Lys Gly Phe Ala Phe Val Glu Met Pro
Glu Ser Ser Glu Ala Ser Asn Ala Ile Lys Glu Leu Asn Gly Ala Glu
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Tyr Ala Gly Arg Pro Met Val Val Lys Glu Ala Leu Pro Arg Asn
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200 205 195 Asp Ala His Leu Leu Glu Glu Ala Gly Cys Phe Gly Leu Val Leu Glu 220 215 Lys Ile Pro Ala Ala Leu Ala Ser Arg Val Ala Ser Glu Leu Thr Ile 235 230 Pro Val Ile Gly Ile Gly Ala Gly Gly Asp Val Asp Gly Gln Val Leu 250 Val Ile Gln Asp Met Leu Gly Met Asn Asn Gly Phe Arg Pro Arg Phe 265 260 Leu Arg Arg Tyr Ala Asp Leu Tyr Thr Val Met Thr Asp Ala Ile Ser 280 His Tyr Val Ser Asp Val Lys Asn Cys Asp Phe Pro Asn Glu Lys Glu 295 Gln Tyr 305 <210> 5565 <211> 443 <212> PRT <213> B.fragilis <400> 5565 Asp Glu Lys Val Trp Phe Met Lys Ile His Leu Lys Leu Thr Glu 10 Arg Tyr Trp Phe Arg Leu Gly Leu Ser Leu Cys Phe Ala Ile Thr Ala 25 Ala Leu Ser Tyr Ala Asp Arg Asp Phe Ile Trp Met Gly Leu Ser Leu 40 Cys Leu Leu Leu Phe Ser Ile Trp Trp Gln Leu Ser Leu Tyr Arg Ile 55 His Thr Lys Arg Val Leu Phe Met Ile Asp Ala Leu Glu Asn Asn Asp 70 75 Ser Ala Ile His Phe Pro Glu Glu Gln Ile Met Pro Glu Thr Arg Glu 85 90 Val Asn Arg Ala Leu Asn Arg Val Gly Arg Ile Leu Tyr Asn Val Lys 105 Ser Glu Thr Val Gln Gln Glu Lys Tyr Tyr Glu Leu Ile Met Asp Cys 120 Ile Asn Thr Gly Val Leu Val Leu Asn Glu Asn Gly Ala Val Tyr Gln 135 140 Lys Asn Asn Glu Ala Leu Arg Leu Leu Gly Leu Asn Val Phe Thr His 155 150 Ile Arg Gln Leu Asn Lys Val Asp Ile Gln Leu Met Lys Lys Ile Glu 170 165 Phe Cys Arg Pro Gly Asp Lys Ile Gln Thr Ile Phe Asn Asn Glu Arg 185 190 180 Gly Thr Ile Asn Leu Ser Ile Arg Val Ser Gly Ile Thr Val Arg Glu 195 200 205 Glu Gln Leu Arg Ile Leu Ala Phe Asn Asp Ile Asn Ser Glu Leu Asp 215 220 Glu Lys Glu Ile Asp Ser Trp Ile Arg Leu Thr Arg Val Leu Thr His 235 Glu Ile Met Asn Ser Val Thr Pro Ile Thr Ser Leu Ser Glu Thr Leu 245 250 Leu Ser Leu Ala Asp Thr Arg Asp Glu Glu Ile Arg Arg Gly Leu Gln 270 Thr Ile Ser Thr Thr Gly Lys Gly Leu Leu Ser Phe Val Glu Ser Tyr 280 Arg Arg Phe Thr Arg Ile Pro Thr Pro Glu Pro Ser Leu Phe Tyr Val



325 330 335

Val Tyr Ala Asp Glu Asn Leu Ile Ser Gln Val Val Ile Asn Leu Leu
340 345 350

Lys Asn Ala Ile Gln Ala Ile Asp Ala Gln Ala Asp Gly Lys Ile Glu
355 360 365

Ile Lys Gly Arg Cys Asn Ala Ala Glu Glu Ile Leu Ile Glu Ile Lys 370 375 380

Asn Asn Gly Pro Ala Ile Pro Ser Asp Ile Ala Asp His Ile Phe Ile 385 390 395 400

Pro Phe Phe Thr Thr Lys Glu Gly Gly Ser Gly Ile Gly Leu Ser Ile 405 410 415

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Gly Lys Glu Thr Lys Phe Ile Leu Lys Phe Lys 435 440

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Gly Met Ala Val Leu Ser Leu Leu Phe Tyr Thr Glu Asn Val Ala Ala 20 25 30

Gln Thr Asp Lys Asn Asp Thr Lys Gln Lys Ile Asp Thr Ile Gln Thr 35 40 45

Thr Gln Pro Glu Tyr Ser Lys Tyr Asp Lys Arg Ile His Arg Phe Arg
50 55 60

Lys Gly Trp Asn Ser Leu Ile Pro Thr His Asn Lys Ile Gln Tyr Ala
65 70 75 80
Gly Asn Met Cly Met Phe Ser Phe Cly Thr Gly Trp Asn Tyr Gly Lys

Gly Asn Met Gly Met Phe Ser Phe Gly Thr Gly Trp Asp Tyr Gly Lys 85 90 95

Arg Asp Gln Trp Glu Thr Asp Leu Phe Phe Gly Phe Ile Pro Lys His
100 105 110

Asp Ser His Arg Ala Lys Met Thr Met Thr Leu Lys Gln Asn Tyr Met
115 120 125

Pro Trp Ser Leu Glu Leu Gly Lys Gly Phe Ser Thr Glu Pro Leu Ala 130 135 140

Cys Gly Ile Tyr Phe Asn Thr Val Phe Gly His Glu Phe Trp Val His 145 150 155 160

Glu Pro Ser Arg Tyr Pro Glu Gly Tyr Tyr Gly Phe Ser Ser Lys Ile 165 170 175

Arg Thr His Ile Phe Leu Gly Gln Arg Leu Thr Tyr Asp Ile Asp Arg 180 185 190

Glu Arg Arg Phe Phe Ala Lys Ser Val Thr Leu Phe Tyr Glu Leu Ser 195 200 205

Thr Cys Asp Leu Leu Ile Ser Arg Val Thr Asn Ser Tyr Leu Arg 210 215 220

Ala Arg Asp Tyr Leu Ser Leu Ser Phe Gly Leu Lys Phe Gln Trp Leu 225 230 235 240

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Ser Gln Leu Arg Cys Ser Ile Trp Val His Pro Ala Ser Ala Ser Ala 65 70 75 80

Arg Pro Arg Gly

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<211> 422

<212> PRT

<213> B.fragilis

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Leu Ser Phe Ser Leu Phe Tyr Arg Asn His Leu Val Ala Arg Ser Gly
1 5 10 15

Phe Ile Gly Arg Lys Val Val Phe Leu Arg His Tyr Ile Leu Lys Tyr 20 25 30

Ser Ile Met Lys Lys Ile Leu Leu Leu Gly Ser Gly Glu Leu Gly Lys 35 40 45

Glu Phe Val Ile Ser Ala Gln Arg Lys Gly Gln His Ile Ile Ala Cys
50 55 60

Asp Ser Tyr Ala Gly Ala Pro Ala Met Gln Val Ala Asp Glu Cys Glu 65 70 75 80
Val Phe Asp Met Leu Asn Gly Glu Glu Leu Glu Arg Ile Val Lys Lys

85 90 95
His Arg Pro Asp Ile Ile Val Pro Glu Ile Glu Ala Ile Arg Thr Glu

His Arg Pro Asp Ile Ile Val Pro Glu Ile Glu Ala Ile Arg Thr Glu

100
105
110

Arg Leu Tyr Asp Phe Glu Lys Glu Gly Ile Gln Val Val Pro Ser Ala 115 120 125

Arg Ala Val Asn Tyr Thr Met Asn Arg Lys Ala Ile Arg Asp Leu Ala 130 135 140

Ala Lys Glu Leu Gly Leu Lys Thr Ala Lys Tyr Tyr Ala Lys Ser 145 150 155 160

Leu Glu Glu Leu Lys Glu Ala Ala Glu Lys Ile Gly Phe Pro Cys Val 165 170 175

Val Lys Pro Leu Met Ser Ser Ser Gly Lys Gly Gln Ser Leu Val Lys 180 185 190

Ser Ala Ala Glu Leu Glu His Ala Trp Glu Tyr Gly Cys Asn Gly Ser 195 200 205

Arg Gly Asp Ile Arg Glu Leu Ile Ile Glu Glu Phe Ile Lys Phe Asp 210 215 220

Ser Glu Ile Thr Leu Leu Thr Val Thr Gln Lys Asn Gly Pro Thr Leu 225 230 235 240

Phe Cys Pro Pro Ile Gly His Val Gln Lys Gly Gly Asp Tyr Arg Glu

245 250 255

Ser Phe Gln Pro Ala His Ile Asp Pro Ala His Leu Lys Glu Ala Glu
260 265 270

Asp Met Ala Glu Lys Val Thr Arg Ala Leu Thr Gly Ala Gly Leu Trp

Gly Val Glu Phe Phe Leu Ser His Glu Asn Gly Val Tyr Phe Ser Glu 300 295 Leu Ser Pro Arg Pro His Asp Thr Gly Met Val Thr Leu Ala Gly Thr 315 310 Gln Asn Leu Asn Glu Phe Glu Leu His Leu Arg Ala Val Leu Gly Leu 330 325 Pro Ile Pro Gly Ile Lys Gln Glu Arg Ile Gly Ala Ser Ala Val Ile 345 Leu Ser Pro Ile Ala Ser Gln Glu Arg Pro Gln Tyr Arg Gly Met Glu 360 Glu Val Thr Gly Glu Glu Asp Thr Tyr Leu Arg Ile Phe Gly Lys Pro 380 375 Tyr Thr Arg Val Asn Arg Arg Met Gly Val Val Leu Cys Tyr Ala Pro 390 395 Asn Gly Ser Asp Leu Asp Ala Leu Arg Asp Lys Ala Lys Arg Ile Ala 410 405 Asp Lys Val Glu Val Tyr 420

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165 Asp Ala Leu Gln His Phe Glu Glu Tyr Gly Glu Val Cys Pro Ala Asn 185

170

Trp Ser Lys Gly Lys Asp Ala Met Lys Ala Thr Glu Asp Gly Val Ala 200 195

Asn Tyr Leu Ser Lys His

210

<210> 5570 <211> 77 <212> PRT <213> B.fragilis <400> 5570 Asp His Leu Phe Cys Val Ile Ile Cys Asn Leu Ile Leu Lys Asn Asn 10 Ser Leu Phe Phe Ile Arg Asn Lys Arg His Tyr Tyr Val Leu Lys Lys Ser Leu Lys Tyr Leu Pro Phe Lys Asn Lys Gly Leu Pro Leu His Pro 40 Lys Ser Arg Thr Leu Asp Gly Asn Ala Leu Leu Ala Gln Leu Val Glu 55 Gln Leu Thr Leu Asn Gln Trp Val Gln Gly Ser Ser Pro <210> 5571 <211> 299 <212> PRT <213> B.fragilis <400> 5571 Thr Leu Thr Pro Lys Lys Ser Glu Tyr Ser Pro Leu Tyr His Asn Asn 10 Met His Thr Ile Gln Ile Asn Asp Asp Cys Tyr Arg Val Pro Glu Ser Trp Asp Glu Leu Thr Glu Lys Gln Leu Ser Tyr Leu Val Asn Leu Thr 40 Gln Ser Asp Ile Pro Ile Glu Glu Leu Lys Val His Met Met Leu Tyr 55 Cys Leu Asn Ala His Val Cys Arg Tyr Arg Asp Ile Tyr Arg His Gln 75 70 Val Lys Ile Ser Ile Gly Thr Pro Gly Asn Lys Ile Pro Phe Arg Thr 90 His Lys Lys Lys Tyr Leu Leu Pro Glu Glu Val Asn Arg Leu Ala 105 Lys Leu Phe Asn Phe Leu Leu Met Cys Glu Lys Asp Thr Glu Met Lys 120 Tyr His Val His Pro Glu Leu Thr Val Asn Pro Tyr Arg Ala Phe Phe 140 135 Cys Arg Phe Arg Lys Phe Arg Gly Pro Glu Asp Gly Leu Leu Asp Ile 150 Arg Phe Glu Gln Phe Met His Leu Gln His Tyr Leu Asp Ala Ile Asn 165 170 Gln Asp Pro Glu Gln Ile Asn His Ala Leu Ala Cys Leu Trp His Thr 180 185 Ser Lys Thr Phe Asn Ile Asn Arg Leu Glu Lys Asp Ala Ser Ile Leu 200 205 Ser His Leu Pro His Arg Val Lys Met Ile Met Tyr Trp Tyr Ile Ile 215 220 Gly Ser Leu Ala Tyr Leu Ala Asn Gly Phe Pro Arg Ile Phe Ser Gly 235 230 Asn Gly Lys Ser Asn Gly Arg Val Phe Asp Ser Gln Met Arg Leu Leu 245 250 Asp Ser Leu Ala Gln Ser Asp Met Thr Lys Lys Pro Glu Ile Lys Lys 265 Gly Phe Leu Ile Asp Ala Leu Tyr Thr Met Asp Glu Ser Leu Arg Lys 280

Gln Gln Glu Leu Asn Glu Asn Met Gln Asn Lys 290 295 <210> 5572 <211> 165 <212> PRT <213> B.fragilis <400> 5572 Pro Leu Thr Phe Met Glu Ile Tyr Asn His Phe Glu Tyr Gly Lys Thr Leu Ala Ile Arg Leu Lys Pro Ile Ala His Thr Pro Glu Lys Pro Arg 25 Phe Phe Thr Ala Phe Gly Leu Glu Asp Leu Tyr Asn Phe Asn Asp Lys 40 Leu Ser Ser Val Ser Gly Met Ile Leu Ile Ala Val Asp Gly Cys Glu 55 60 Ser Glu Ser Lys Arg Asn Glu Ser Asp Ala Leu Asn Asn Asn Asp Ile 70 75 Phe Ser Phe Ile Val Val Gln Asn Thr Val Ser Asp Arg Pro Glu Thr 85 90 Val Asn Gln Ala Ala Lys Glu Cys Lys Ala Ile Ala Lys Gln Ile Arq 105 Asn His Ile Leu Gln Asp Pro Asp Ile Ser Glu Phe Ile Asp Asp Thr 120 125 Ile Gln Phe Asn Gly Ile Gly Pro Ile Gly Asp Asn Phe Tyr Gly Val 135 140 Val Leu Thr Phe Ser Leu Val Gln Pro Glu Thr Tyr Phe Ile Asp Gln 150 155 Thr Tyr Trp Glu Asp <210> 5573 <211> 67 <212> PRT <213> B.fragilis <400> 5573 Ile Tyr Pro Pro Thr Ser Asn Val Tyr Leu Lys Met His Met Ser Asp Lys Tyr Glu Met Leu Ser Leu Ile His Asn Thr Ile Val Phe Lys Glu 25 Glu Ser Tyr Met Thr Thr His His Gln Val Asn Ile Leu Ser Cys 40 Lys Val Phe Leu Met Lys Asn Gly Arg Arg Asn Met Ser Thr Leu Phe 50 55 Ser Tyr Leu 65 <210> 5574 <211> 237 <212> PRT <213> B.fragilis <400> 5574 Met Ser Gln Pro Phe Phe Gln Phe Lys Gln Phe Thr Val Trp His Asp 10 Lys Cys Ala Met Lys Val Gly Thr Asp Gly Val Leu Leu Gly Ala Trp 20

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Asn Arg Gln Val Asn Ser Phe Ser Asn Leu Asn Ile Lys Thr Met Ser Val Asn Lys Cys Ile Phe Ile Gly Asn Met Gly Arg Asp Ala Glu Val Arg Thr Thr Glu Thr Gly Ile Lys Val Ala Gln Phe Ser Ile Ala Cys 55 Thr Glu Arg Ala Tyr Thr Asn Lys Ala Gly Gln Thr Ile Pro Glu Arg 70 Thr Glu Trp Ile Pro Val Val Ala Trp Arg Arg Leu Ala Glu Thr Ile 90 Glu Lys Tyr Thr His Lys Gly Ser Lys Leu Tyr Ile Glu Gly Arg Phe 105 Thr Thr Arg Lys Tyr Glu Thr Asn Asp Gly Gln Lys Arg Thr Val Ser 125 120 Glu Ile Val Ala Glu Ser Ile Glu Met Leu Asp Pro Lys Arg Asp Ala 135 Pro Ser Leu Pro Pro Glu Pro Glu Gln Lys Leu Ser Tyr Asn Pro 155 150

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205 200 Val Lys Leu Ala Val Ser Lys Pro Ala Glu Lys Ile Val Gln Ala Ala 220 215 Tyr Val Cys Tyr Glu Asn Gln Lys Leu Gly Ile Val Arg Ser Leu Phe 235 230 Ala Glu Glu Val Pro Glu Arg Val Ile Ile Phe Ala Ser Ser Lys Ile 250 245 Lys Val Lys Glu Val Ala Lys Ala Leu Lys Met Met Lys Leu Asn Val 265 Gly Glu Met His Ser Asp Leu Glu Gln Val Gln Arg Glu Phe Ile Met 280 His Glu Phe Lys Ser Gly Arg Ile Asn Ile Leu Val Ala Thr Asp Ile 300 295 Val Ser Arg Gly Ile Asp Ile Asp Asp Ile Arg Leu Val Ile Asn Phe 315 310 Asp Val Pro His Asp Ser Glu Asp Tyr Val His Arg Ile Gly Arg Thr 325 330 Ala Arg Ala Asn Asn Asp Gly Val Ala Leu Thr Phe Val Asn Glu Lys 345 Glu Gln Thr Asn Phe Lys Asn Ile Glu Asn Phe Leu Glu Lys Glu Ile Tyr Lys Ile Pro Val Pro Ala Glu Leu Gly Glu Ala Pro Gln Tyr Asn 380 375 Pro Arg Ser Tyr Thr Asn Ala Gly Arg Gly Gly Arg Asn Phe Arg Asn 395 390 Gly Asn Arg Lys Asn Asn Asn Gly Gly Arg Ser Thr Ala Pro Arg Ser 410 405 Gly Arg Arg <210> 5578 <211> 156 <212> PRT <213> B.fragilis <400> 5578 Met Ile Thr Thr Lys Ile Glu Val Pro Pro His Leu Cys Glu Tyr Ile Arg Gly Lys Tyr Cys Asn Leu Thr Ser Asp Pro Val Arg Phe Pro Asp 25 Asn Leu Asn Ile Tyr His Val Ile Phe Asp Leu Leu Gln Lys Arg Pro Ser Glu Ala Pro Val Asp Arg Gly Asn Leu Glu Ile Cys Leu Pro Glu 55 Arg Ser Ile Gly Lys Ser Pro Val Thr Tyr Asn Tyr Leu Gly Leu Arg 75 Ser Gln Val Ile Ile Ser Arg Lys Ile Glu Leu Met Met Trp Ala Glu 90 85 Leu His Glu Tyr Leu Asp Glu Gln Lys His Arg Tyr Gly Ile Lys Tyr 105 Ile Asp Gly Val Gln Phe Phe Met Arg Arg Tyr Gly Ile Asp Ser Leu 120 Thr Glu Glu Ala Phe Leu Lys His Tyr Gln Arg Trp Arg Ala Lys Val 135 Arg Arg Lys Glu Lys Arg Ser Tyr Lys Lys Arg Glu 150 <210> 5579 <211> 103

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Glu Asp Asp Thr
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Glu Asp Asp Thr Gly Asp Asn Gly Tyr Thr Phe Thr Ser Cys Ile Pro

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Thr Ser Ser Tyr Asn Ser Gly Leu Asp Ser Asp Lys Thr Tyr Asn Asn

Thr Ser Ser Tyr Asn Ser Gly Leu Asp Ser Asp Lys Thr Tyr Asn Asn 20 25 30

Thr Lys Val Tyr His Ser Ser Ser Leu Ile Gln Val Ile Lys Ser Glu 35 40 45

Leu Thr His Glu Ala Ala Leu Leu His Val Leu Phe Leu Ser Val Met 50 55 60

Cys Leu Arg Ile Ile Gly Tyr Arg Arg Gly Leu Met Leu Ser Ser Tyr 65 70 75 80
Ser Trp His Ser Pro Phe Phe Ser Phe Ser Ile Trp Leu Ile Arg Leu

85 90
Arg Ile Ala Ile Asn Leu Ser

<210> 5580 <211> 103 <212> PRT

100

<213> B.fragilis

<400> 5580

Ala Gly Cys Thr Ser Leu Leu Ala Asn Lys Thr Lys Ala Gln Ile Gln 1 5 10 15

Ala Ile Asn Asp Ile Val Ile Ala Ile Val Phe Asn Ile Arg Ser Trp 20 25 30

Pro Leu Val Asn Ala Pro Ser Gly Ile Pro Leu Pro Ile Ile Phe Glu 35 40 45

Leu Ala Gly Ile Asn Glu Lys Arg Val Glu Asp Val Ala Ala Val Ala 50 55 60

Ile Gln Val Val Ile Ser Pro Thr Pro Ala Thr Thr Cys Pro Ala Thr
65 70 75 80

Lyg Clu Clu Val Glu Val Asp Arg Val Asp Met Gln Ile Pro Pro Ile

Lys Glu Glu Val Glu Val Asp Arg Val Asn Met Gln Ile Pro Pro Ile 85 90 95

Ile Val Thr Thr Ala Ala Arg 100

<210> 5581 <211> 380

<212> PRT

<213> B.fragilis

<400> 5581

Leu Gln Cys Thr Met Ser Leu Thr Ala Asn Ile Tyr Pro Ser Thr Ile

5 10 15

Ala Leu Ala Gly Asn Pro Ile Lys Leu Thr Ile Asn Ser Ser Val 20 25 30

Val Ser Tyr Thr Ile Arg Gln Ala Asp Arg Thr Ile Phe Ser Gly Ser 35 40 45

Gly Glu Gly Glu Phe Ser Val Phe Leu Gln Asp Ile Leu Ser Gly Ile 50 55 60

Leu Ser Pro Lys His Leu Leu Asn Glu Ser Thr Asp Ile Leu Leu 65 70 75 80

Asp Ser Thr Ser Ala Thr Asp Ile Ala Ile Ser Val Gln Asn Thr Gln 85 90 95 Gly Glu Thr Lys Thr Leu Ser Leu Lys Ala Val Ile Gly Gly Ile Ser

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105 100 Lys Arg Leu Leu Arg Arg Leu Leu Asp Glu Asn Ser Asn Ile Phe Thr 125 120 Trp Lys Leu Phe Asn Ser Ser Val Asn Phe Phe Lys Thr Thr Arg Thr 135 Asn Gly Arg Ile Ile Thr Ile Arg Glu Thr Glu Leu Leu Pro Ile Pro 155 150 Phe Leu Tyr Pro Asp Gly Ala Leu Lys Val Val Ala Ala Gly Ile Glu 170 165 Thr Ser Leu Ser Gly Thr Ala Gly Gln Pro Val Ala Leu Asn Leu Tyr 185 Arg Leu Arg Lys Lys Leu Phe Gln Thr Asn Gln Lys Leu Ala Ser Val 200 Phe Asp Ile Tyr Ser Gly Ser Thr Lys Ser Cys Thr Ile Val Ile Thr 220 215 Pro Gly Thr Val Ser Arg Glu Arg Tyr Leu Leu Glu Phe Leu Asn Ser 230 235 Tyr Gly Ala Tyr Glu Arg Ile Glu Val Thr Gly Ile Gly Asn Ile Glu 250 245 Ser Glu Ile Glu Ser Asp Ser Thr Tyr Gln Ile Tyr Asp Glu Ser Ile 265 260 Asp Asp Tyr Ile Glu Ala Arg Glu Arg Gln Ser Ala Arg Asp Lys Leu 280 Leu Val Glu Ser Gly Tyr Arg Asn Thr Glu Glu Leu Val His Leu Met 300 295 Asp Met Leu Ala Ser Asp Asp Ile Lys Ile Leu Gly Leu Ser Gly Arg 315 310 Asn Ile Arg Val Asn Ala Val Ala Asp Asn Leu Thr His Ala Ile Arg 330 325 Ser Thr Val Pro Glu Ser Ile Lys Met Thr Leu His Phe Val Asp Ser 345 Asp Val Arg Tyr Thr Gly Ser Leu Ser Glu Asp Glu Ile Gly Asn Pro 360 Arg Ile His Thr Glu Gln Phe Thr Pro Gln Phe Asn 375 <210> 5582 <211> 322 <212> PRT <213> B.fragilis <400> 5582 Lys Tyr Arg Phe Asn Leu Arg Asn Arg Arg Lys Met Asn Ala Ile Ile 10 Pro Asp Ile Asp Thr Leu Lys Lys Val Val Lys Ile Asn Ala Thr Leu Pro Asp Glu Ala Ile Asn Pro Tyr Ile Asp Asp Ala Met Asp Ile Tyr 45 40 Leu Thr Pro Tyr Ile Gly Ile Lys Thr Val Glu Lys Ala Leu Thr Gly

| Asp | Glu | Ala | He | Ash | Flo | Tyr | He | Asp | Asp | Ala | Lec | Thr | Asp |

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140 135 Pro Glu Tyr Ala Glu His Cys Lys Gln Ala Thr Asp Ser Ser Cys Phe 155 150 Ile Arg Asp Ala Arg Glu Phe Gln Asp Thr Gly Leu Val Asn Ile Glu 170 165 Tyr Ser Thr Val Ser Phe Arg Met Met Leu Pro Thr Val Arg Gln Leu 190 185 Gln Glu Arg Asn Val Arg Glu Met Leu Lys Glu Asp Leu Tyr Gln Arg 205 200 Leu Leu Asp Ala His Thr Ala Gly Lys Glu Leu Thr Pro Lys Glu Lys 215 Val Leu Leu Gly His Ile Leu Arg Tyr Leu Ala Asn Lys Thr Ala Glu 235 230 Leu Tyr Thr Ser Gln Thr Ser Arg Glu Gln Arg Thr Ile Asn Asp Thr 250 245 Pro Glu Phe Thr Pro Ile Ile Arg Pro Ile Tyr Gln Asp Gln Ala Ala 265 Thr Gly Asn Phe Phe Ala Asp Gln Ala Thr Tyr Tyr Ala Gly Lys Ile 280 Gln Asn Phe Ile Ser Glu Asn Ala Glu Glu Leu Gly Val Thr Pro Thr 300 295 Val Thr Ala Ile Asn Phe Asn Ser Lys Glu Lys Arg Ile Phe Thr Ser 315 310 Ile Ser

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<400> 5583

Asn Met Ile Thr Trp Asp Asn Phe Tyr Leu Phe Ala Val Ala Ser Ile Cys Leu Trp Leu Thr Gly Ala Ile Phe Ala Leu Arg Ser Ser Val Arg 25 Ser Arg Met Ala Val Val Leu Thr Ile Ala Gly Ile Thr Cys Leu Gly Ile Phe Ile Ala Gly Leu Trp Ile Ser Leu Gln Arg Pro Pro Leu Arg 55 Thr Met Gly Glu Thr Arg Leu Trp Tyr Ser Phe Phe Met Gly Ile Ala 75 Gly Leu Leu Thr Tyr Ile Arg Trp Lys Tyr Arg Trp Ile Leu Ser Phe 90 85 Ser Thr Leu Leu Ser Thr Val Phe Val Ile Ile Asn Leu Leu Lys Pro 105 100 Glu Ile His Asp Gln Ser Leu Met Pro Ala Leu Gln Ser Ile Trp Phe 125 120 Ile Pro His Val Thr Val Tyr Met Phe Ser Tyr Ser Val Leu Gly Cys 135 Ala Phe Ile Ile Ala Leu Cys Gly Leu Val His His Lys Glu Glu Tyr 155 150 Leu Val Thr Ala Asp Asn Leu Val Tyr Ser Gly Val Ala Phe Leu Ser 170 165 Ile Gly Met Leu Leu Gly Ser Leu Trp Ala Lys Glu Ala Trp Gly Asn 185 190 180 Tyr Trp Ser Trp Asp Pro Lys Glu Thr Trp Ala Val Val Thr Trp Met 200 Gly Tyr Leu Leu Tyr Ile His Leu Arg Leu Arg Arg Lys Phe Arg Lys

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210 215 220

Lys Met Leu Tyr Val Ile Leu Ile Phe Ser Phe Leu Ala Leu Gln Met 225 230 235 240

Cys Trp Tyr Gly Val Asn Tyr Leu Pro Ser Ala Gln Gln Ser Val His 245 255

Leu Tyr Asn Arg Asn Asn

260

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<400> 5584

Ile Asn Glu Thr Val Ser Asn Met Ala Asn Asp Leu Asn Arg Ser Ile 1 5 10 15 Lys Leu Tyr Ile Asp Gly Ser Glu Ala Thr Asn Lys Ile Asp Leu Val

20 25 30

Lys Glu Ser Ile Ser Arg Leu Glu Asp Lys Leu Arg Ser Leu Thr Gly
35 40 45

Lys Glu Val Asp Tyr Ala Lys Arg Ser Gln Asp Leu Lys Lys Glu Leu 50 55 60

Asp Ala Lys Asn Arg Thr Leu Gln Asn Tyr Glu Lys Gln Leu Ala Glu
65 70 75 80

Thr Glu Arg Val Leu Lys Ser Leu Ser Gly Ala Thr Tyr Asn Glu Leu 85 90 95 Leu Ala Val Gln Ser Arg Val Arg Lys Glu Leu Arg Asn Ala Val Pro

100 105 110

Gly Thr Lys Gln Tyr Thr Ala Ala Leu Glu Gln Asn Arg Arg Val Thr

115 120 125
Glu Ala Leu Ser Arg Ala Gln Ala Asn Met Arg Val Glu Val Gly Ala

130 135 140
Gln Gly Asn Ile Trp Ser Arg Ala Ser Gly Phe Ile Asn Lys Tyr Ile
145 150 155 160

Gly Leu Ile Gly Thr Val Ile Ala Ala Ile Thr Gly Val Ser Met Lys
165 170 175

Leu Asn Gln Leu Arg Glu Gln Arg Asn Lys Arg Glu Glu Ala Lys Ala 180 185 190

Asp Val Glu Ala Leu Thr Gly Leu Ser Lys Asp Asp Ile Asn Trp Leu
195 200 205

Glu Gln Gln Ala Val Gln Leu Ser Thr Thr Met Thr Glu Ser Gly Ile 210 215 220

Arg Ile Arg Gln Ser Ala Thr Glu Ile Leu Asp Ala Tyr Lys Leu Val 225 230 235 240

Gly Ser Ala Lys Pro Glu Phe Leu Asp Asn Lys Glu Ala Leu Ala Glu 245 250 255

Val Thr Lys Gln Thr Leu Ile Leu Ala Ser Ala Ser Gly Met Thr Leu 260 265 270

Lys Asp Ala Val Asp Ala Val Thr Leu Ser Leu Asn Gln Tyr Gly Asp 275 280 285

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Lys Tyr Gly Ala Ala Ala Val Glu Ser Val Thr Thr Ala Val Thr Lys 305 310 315 320

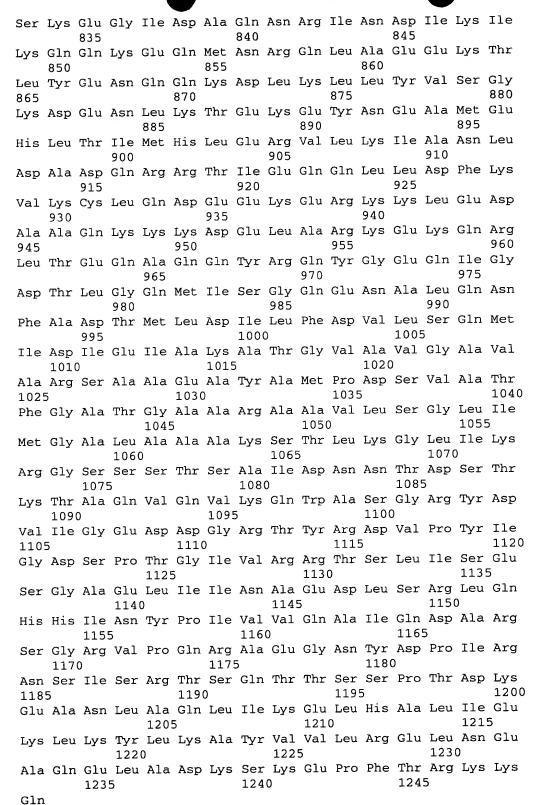
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Gly Thr Gly Leu Lys Lys Phe Phe Leu Thr Leu Gln Thr Gly Ala Asp

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Gln 385		Lys	Gln	Leu			Ala	Gln	Ile	Lys 395		Gln	Phe	Gly	Glu 400
Glu				405			Val		410					415	
_			420				Thr	425					430		
		435					Ala 440					445			
	450					455	Ile				460				
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545					550		Ile			555					560
				565			Ser		570					575	
			580				Ile	585					590		
		595					Asn 600 Glu					605			
	610					615	Thr				620				
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705	_				710		Lys			715					720
				725			Ser		730					735	
			740					745					750		Asn
		755					Ile 760					765			
	770					775					780				Leu Gln
785					790					795					800
				805			Gln		810					815	
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<211> 153

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<213> B.fragilis

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Ser	Ala	Lys 35	Ala	Val	Tyr	Phe	Lys 40	Asp	Ser	Glu	Val	His 45	Glu	Asp	Lys
Asp	Ala 50	Ala	Lys	Ala	Ile	Leu 55	Ser	Ala	Lys	Arg	Lys 60	Glu	Tyr	Arg	Asp
65		_			70					75				Tyr	80
				85					90					Ile 95	
			100					105					110	Thr	
		115					120					125		Arg	
Thr	His 130	Glu	Pro	Lys	Asn	Asp 135	Glu	Glu	Met	Gln	Lys 140	Ala	Ile	Phe	Asp
Phe 145	His	Lys	Asn	Gly	Asn 150	Ser	Trp	Val							
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1				5					10					His 15	
			20					25					30	Asn	
		35					40					45		Ser	
	50					55					60			Phe	
65					70					75				Lys -	80
				85					90					Lys 95	
		-	100					105					110	Ser	
		115					120					125		Gly	
	130					135					140			Asp	
145					150					155				Gly	160
				165					170					Phe 175	
			180					185					190		
		195					200					205		Asp	
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Gly		Ala	Asn	Gly	Asn 230		Leu	Val	Val	Phe 235		Gly	Gly	Asp	Tyr 240

Ala Ile Ser Ala Thr His Tyr Phe Ser Thr Asp Lys Lys Ile Val Leu 250 Glu Tyr Asp Arg Cys Ser Tyr Ile Ser Cys Ile Tyr Leu Gly Asp Ser 265 260 Phe Ala Asn Lys Ser Asp Phe Tyr Ser Gln Leu Lys Gly Arg Leu Asp 280 Lys Leu Thr Glu Ser Ile Gly Ile Ile Gln Ile Ala His His Gly Ala 295 300 Lys Gly Asn Phe Ser Pro Asn Ile Leu Lys Leu Gly Thr Asn Pro Leu 315 310 Ala Ile Ile Ser Cys Lys Ser Thr Asp Lys His His Pro Ser Val Asn 325 330

Val Val Lys Gln Ile Gln Glu Asn Gly Ser Ile Pro Phe Ile Val Thr 345

Glu Lys Pro Thr Thr Glu Val Glu Gln Ile Gly Tyr Tyr 360

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<213> B.fragilis

<400> 5587

Leu Phe Tyr Phe Thr Leu Phe Ser Thr Glu Ser Val Glu Ser Arg Ser 10

Asn Leu Lys Leu Leu Phe Leu Asn Leu Phe Ile Asn Phe Tyr Phe 25

Phe Tyr Phe Met Asn Met Tyr Ile Gly Asn Leu Ser Tyr Arg Val Lys 40

Glu Ala Asp Leu Arg Gln Val Met Glu Glu Tyr Gly Thr Val Asp Ser 55

Val Lys Leu Ile Ile Asp Arg Glu Thr Arg Lys Ser Lys Gly Phe Ala 75 Phe Val Glu Met Pro Asn Asp Asp Glu Ala Lys Asn Val Ile Ser Glu

Leu Asn Gly Ala Glu Tyr Glu Gly Arg Gln Met Val Val Lys Glu Ala 110

Leu Pro Arg Asn 115

100

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<213> B.fragilis

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Tyr Asn Phe Ile Pro Leu His Phe Ile Thr Thr Ile Lys Ser Met Arg 25 2.0

Lys Phe Ile Ile Ser Phe Cys Cys Tyr Val Phe Phe Ile Phe Thr Leu 45 40

Ala Ala Gln Asp Lys Ala Pro His Tyr Thr Val Ile Val Ser Leu Asp 55

Ala Phe Arg Trp Asp Tyr Pro Ala Met Tyr Asp Thr Pro Asn Leu Asn 75 70

Gln Met Ala Arg Glu Gly Val Lys Ala Thr Met Leu Pro Ser Tyr Pro Ala Ser Thr Phe Pro Asn His Tyr Thr Leu Ala Thr Gly Leu Val Pro

105 Asp His Asn Gly Ile Ile Asn Asn Thr Phe Trp Asp Val Lys Arg Arg 120 Arg Gln Tyr Ser Met Gly Asp Pro Ala Thr Arg Asn Asn Pro Asp Tyr 140 135 Tyr Leu Gly Glu Pro Ile Trp Ile Thr Ala Gln Lys Gln Gly Val Lys 155 150 Thr Gly Asn Val Tyr Trp Val Gly Ser Asp Ile Ala Ile Lys Gly Gly 170 165 Tyr Pro Thr Tyr Tyr Arg Glu Tyr Ala Glu Lys Pro Arg Leu Thr Phe 185 Glu Gln Arg Val Asp Ser Thr Ile Ala Leu Leu Glu Lys Pro Glu Ala 200 Glu Arg Pro Arg Leu Val Met Leu Tyr Phe Glu Glu Pro Asp Gly Val 220 215 Thr His His Gly Pro Arg Ser Val Glu Ala Ala Ala Ile Ile His 230 235 Arg Met Asp Ser Leu Val Gly Met Leu Arg Gln Gly Ile Ala Ser Leu 250 245 Pro Phe Gly Lys Asp Val Asn Leu Ile Val Thr Ala Asp His Gly Met 265 Thr Glu Ile Ser Asp Asp Arg Val Val Asp Met Asn Lys Tyr Leu Arg 280 Pro Glu Trp Cys Glu Ala Val Asp Gly Arg Thr Pro Thr Ser Ile Phe 295 300 Thr Lys Pro Glu Tyr Arg Asp Ser Val Tyr Asn Ala Leu Lys Asp Val 315 310 Pro His Ile His Val Trp Lys Lys Glu Glu Ile Pro Val Glu Leu Asn 330 325 Tyr Gly Ser Ser Asp Arg Ile Gly Asp Ile Val Val Ala Pro Glu Leu 345 Gly Trp Gln Phe Thr Asp Val Pro Arg Ala Leu Lys Gly Ala His Gly 365 360 Tyr Phe Pro Gln Ser Pro Asp Met Gln Val Met Phe Arg Ala Cys Gly 375 Pro Asp Phe Lys Ala Gly Tyr Glu Ser Lys Gly Phe Val Asn Val Asp 395 390 Ile Tyr Pro Leu Leu Ala His Leu Leu Lys Ile Thr Pro Glu Lys Thr 410 405 Asp Gly Gln Phe Glu Arg Ile Lys Asp Ile Leu Lys Asp Val Ser Phe 425 <210> 5589

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Pro Ala Ala Phe Glu Glu Ile Leu Ile Val Gln Thr Leu Asn Asp Glu

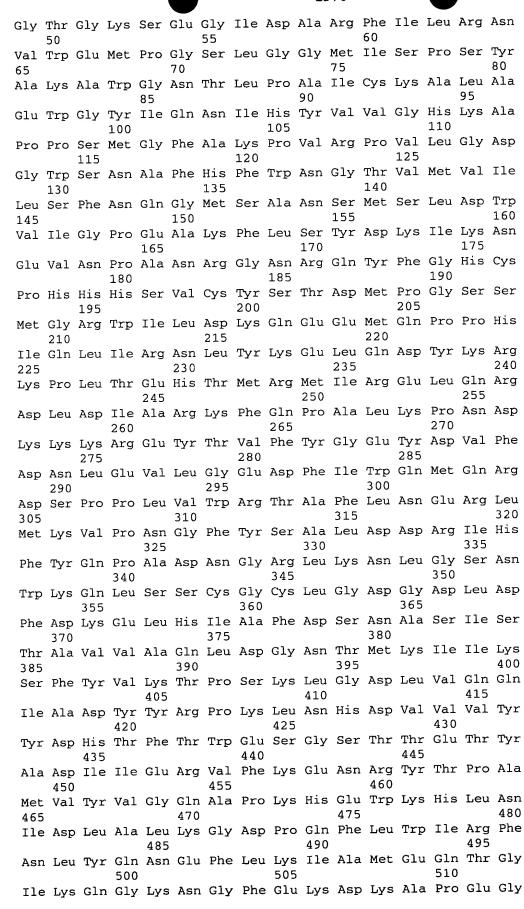
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<sup>&</sup>lt;212> PRT

<sup>&</sup>lt;213> B.fragilis

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11 4 1 4 1 4 1 1 1 4 4 4 1 1 1 1	12
11 6 1 1 1 1 1 1 1 1 1	M
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90 85 Gln Arg Thr Gln Glu Thr Asp Ile Arg Thr Glu Ala Ile Asp Arg Leu 105 Gln Glu Glu Ile Asp Gly Leu His Asn Arg Ile Ser Glu Leu Glu Ser 120 Asp Thr Glu Asn His Ala Asp Glu Leu Ser Ala Leu Asn Glu Glu Phe 135 140 Glu Glu Lys Met Lys Glu Leu Ser Ala Ile Arg Gly Glu Leu Asp Ala 155 150 Leu Asn Thr Pro Gly Val Lys Ile Val Thr Glu Glu Ser Leu Thr Pro 170 Ala Leu Arg Lys Ala Tyr Ala Arg Ile Lys Glu Ile Ala Pro Leu Tyr 185 180 Ala Ser Leu His Asn Asp Ile Ala Asn Pro Asp Ile Pro Ala Glu Glu 205 200 Arg His Pro Leu Ala Glu Glu Leu Cys Lys Leu Asp Asp Glu Arg Arg 215 Lys Leu Trp Lys Gln Ile Asp Asp Tyr Ala Glu Gly Lys Gln Ala Thr 235 230 Leu Glu Leu Asp Ala Lys Arg Pro Glu Tyr Ser Glu Asn Ala Val Val 250 245 Arg Gly Phe Glu Ile Ala Arg Gln Ile Lys Arg Leu Lys Gln Asn Ile 265 Thr Asn Ser Lys Thr Ala Ala Glu Arg Ala Gly Lys Glu Gly Lys Gln 280 275 Ala Val Leu Gln Asn Ala Leu Asp Arg Ile Ala Lys Tyr Glu Thr Glu 300 295 Leu Ala Ala Leu Thr Ala Glu Leu Ser Ala Glu Gln Gly Glu Lys Val 305 310 Ser Gly <210> 5590 <211> 63 <212> PRT <213> B.fragilis <400> 5590 Phe Ala Ile Ala Gln Val Gly Thr Phe Ile Arg Pro Arg Tyr Ala Ser 10 Ala Tyr Arg Gly Phe Val Phe Trp Gly Arg Ser Pro Phe Thr Pro Phe 25 Cys Leu Glu Glu Arg Phe Glu Gln Leu Tyr Leu Arg Arg Ser Lys Ala 40 Gly Asn Lys Val Ser Ile Tyr Tyr Phe Tyr Phe Phe Phe Leu Leu <210> 5591 <211> 574 <212> PRT <213> B.fragilis <400> 5591 Gly Met Thr Ala Gln Ala Ser Pro Ile Pro Ser Ala Tyr Glu Leu Arg 10 Met Lys Gln Ala Asn Val Ile Arg Lys Phe Phe Asn Lys Met Gln Arg 25 Gln Ala Met Ala Ile Ala Ala His Asp Glu Tyr Ile Val Ala Ser Arg 40



Thr Asp Asp Thr Pro Asp Asn Pro Asp Gln Tyr Lys Thr His Val Thr 530

Asp Ala Phe Asp Thr Leu Trp Leu Gly Met Asn Phe Tyr Phe Thr Arg 545

Pro Gly Thr Gly Thr Gly Gly Ile Phe Phe Leu Asn Arg Lys

565

<210> 5592 <211> 1018 <212> PRT

<213> B.fragilis

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345

Lys Asn Arg Asn Ile Phe Val Glu Ile Phe Val Gly His Ile Asn Lys

Asn Glu Ala Gly Asp Lys Gly Leu Asp Asp Leu Leu Ala Asn Ser Leu

	370		_	_		375					380			ser	
Arg 385	Gly	Lys	Glu	Glu	Glu 390	Leu	Ala	Ala	Asp	Ile 395	Glu	Phe	Ala	Cys	Asn 400
Glu	Lys	Lys	Gly	Leu 405		Lys	Tyr	Ile	Glu 410	Met	Phe	Lys	Val	Thr 415	Thr
Trp	Thr	qaA	His 420		Leu	Gln	Glu	Leu 425	Trp	Gly	Leu	His	Ser 430	His	Glu
Val	Phe	Ala 435		Arg	His	Ala	Asp		Leu	Arg	Asn	Leu 445	Pro	Glu	Phe
Leu	Phe 450		Arg	Tyr	Arg	Trp 455	Lys	Phe	Asp	Glu	His 460	Gly	Lys	Val	Ile
465					470					475				Val	480
_				485					490					Cys 495	
			500					505					510	Leu	
		515					520					525		Val	
	530					535					540			Phe	
545					550					555				Gly	560
				565					570					11e 575	
			580					585					590	Phe	
		595					600					605		Gly	
	610					615					620			Thr	
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		675					680					685		Leu	
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			740					745					750		
		755					760					765		Phe	
	770					775					780			Arg	
785					790					795					800
				805	ı				810					Asn 815	
Ala	TIE	arg	820		σтλ	ser	ser	825		дар	ALG	GIII	830		Leu

Ala Phe Ser Asp Phe Tyr Asn Asp Thr His Lys Pro Val Asp Asp Phe 845 840 Gly Val Leu Phe Phe Ser Glu Trp Asp Phe Glu Gln Trp Asn Leu Thr 860 Trp Asn Leu Leu Ala Asn Cys Val Gln Leu Tyr Leu Thr Tyr Gly Val 875 870 Val Gln Ala Pro Gly Glu Arg Leu Glu Gln Arg Lys Leu Arg Gln Glu 885 890 Met Gly Glu Thr Leu Ile Ser Trp Ala Asp Glu Tyr Phe Ser Gly Glu 905 900 Glu His Leu Asn Val Arg Leu Pro Arg Lys Asp Leu Tyr Asp Ala Phe 925 920 Cys Gln Tyr Asp Asn Gln Gln Arg Lys Phe Val Ser Pro Thr Ala Phe 935 Lys Lys Lys Phe Ile Met Tyr Cys Ser Trp Lys Gly Tyr Val Phe Asn 955 950 Pro His Lys Tyr Asp Ser Ile Thr Gly Lys Pro Phe Gln Val Asp Lys 965 970 Asp Gly Lys Ala Val Val Asp Asp Lys Ser Gly Gly Val Glu Tyr Phe 985 Thr Val Gly Thr Gly Ala Gln Pro Ile Pro Lys Glu Asp Asn Ser Arg 1000 Leu Pro Gln Pro Thr Gly Lys Leu Val Phe 1015

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<213> B.fragilis

<400> 5593

210

Lys Leu Pro Ala Ile Cys Ile Lys Lys Lys Arg Ile Met Lys Ile Arg Phe Ile Ser Leu Ala Ser Gly Ser Ser Gly Asn Cys Tyr Tyr Leu Gly 25 Thr Glu Lys Tyr Gly Ile Leu Ile Asp Ala Gly Ile Gly Ile Arg Thr Ile Lys Lys Ser Leu Lys Asp Ile Asn Val Thr Met Asp Ser Ile Arg 55 Ala Val Phe Ile Thr His Asp His Ala Asp His Ile Lys Ala Val Gly 75 His Leu Gly Glu Lys Leu Asn Ile Pro Val Tyr Thr Thr Ala Arg Val 90 85 His Ala Gly Ile Asn Lys Ser Tyr Cys Met Thr Glu Lys Leu His Gly 105 Ser Val Arg Tyr Leu Glu Lys Glu Glu Pro Met Gln Leu Glu Asp Phe 120 Arg Ile Glu Ser Phe Glu Val Pro His Asp Gly Thr Asp Asn Val Gly 140 135 Tyr Cys Ile Glu Ile Asp Gly Lys Val Phe Ser Phe Leu Thr Asp Leu 155 150 Gly Glu Ile Thr Pro Thr Ala Ala Arg Tyr Ile Cys Lys Ala His Tyr 170 Leu Ile Ile Glu Ala Asn Tyr Asp Glu Glu Met Leu Arg Met Gly Pro 185 Tyr Pro Thr Tyr Leu Lys Glu Arg Ile Ser Ser Lys Thr Gly His Met 205 200 Ser Asn Ile Asp Thr Ala Asn Phe Leu Ala Glu Asn Ile Met Glu His

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Leu Arg Tyr Ile Trp Leu Cys His Leu Ser Lys Asp Asn Asn His Pro
                                        235
                    230
Glu Leu Ala Tyr Lys Thr Val Glu Trp Lys Leu Lys Ser Lys Gly Ile
                245
                                    250
Ile Val Gly Lys Asp Val Gln Leu Leu Ala Leu Lys Arg Asn Thr Pro
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Ser Glu Leu Tyr Glu Phe Glu
       275
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Cys Lys Glu Ala Tyr Gln Cys Lys Ile Ile Glu Ala Gly Phe Asp Ser
Arg Lys Pro Thr Leu Ile Leu Ile Ile Met Lys Thr Val His Ser Ser
Pro Ser Leu Ser Pro Ser Gly Thr Lys Arg Gln Lys Ala Asn Leu Phe
                            40
Thr Asn Glu Asn Pro Glu Thr Ile Ala Gln Met Arg Met Gln Ser Ala
                        55
Gln Lys Glu Gln His Lys Val Met Val Arg Leu Asp Asn Arg Thr His
                                        75
Val Leu Val Ala Pro Gln Asn Val Thr Pro Glu Tyr Ile Glu Met Leu
                                    90
Arg Lys Lys Tyr Gln Ile Thr Tyr Asn Ala Pro Ala Arg Gly Gly Arg
Arg
<210> 5595
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Met Arg Asp Ile Pro Met Asn Leu Lys Met Met Lys Arg Cys Lys Lys
                                25
Leu Phe Leu Ile Phe Ile Arg Thr Glu Ile Ala Gly Tyr Asp Tyr Lys
                            40
Gln Asp Gln Lys Gly Ser Asn Met Lys Leu Arg Lys Lys Glu Leu Lys
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Tyr Gly Ile Arg Asn Tyr Lys Asn Arg
<210> 5596
<211> 359
<212> PRT
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Ser Val Asn Phe Ala His Met Ile Glu Leu Ala Gln His Ile Glu Val
Leu Leu Glu Asn Asp Cys Val Ile Val Pro Gly Phe Gly Gly Phe
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Ile Ala His Tyr Ala Pro Ala Met Arg Val Ala Glu Glu Asn Leu Phe 40 45 Leu Pro Pro Thr Arg Thr Ile Gly Phe Asn Pro Gln Leu Thr Leu Asn Asp Gly Val Leu Val Gln Ser Tyr Met Ala Val Tyr Asp Thr Asn Phe Ser Asp Ala Thr Lys Met Val Glu Lys Glu Val Ala Glu Leu Ile Ser Ala Leu His Glu Asp Gly Lys Thr Asp Leu Pro Asn Ile Gly Glu Ile 105 Arg Tyr Thr Ile His Asn Thr Tyr Glu Phe Val Pro Tyr Asp Asn Lys 120 Ile Thr Thr Pro Tyr Leu Tyr Gly Leu Asp Ser Phe Glu Met Lys Glu 135 140 Leu Ser Ala Leu Arg Arg Pro Glu Lys Glu Gln Ile Leu Pro Thr Val 150 155 Leu Lys Lys Lys Thr Ser Tyr Glu Phe Arg Ala Asn Trp Ala Phe Leu 165 170 Arg Asn Ala Val Ala Met Ile Ala Ala Val Ala Leu Phe Phe Phe Met 185 Ser Thr Pro Val Glu Asn Thr Tyr Ile Glu Lys Gly Asn Tyr Ala Arg 200 205 Leu Leu Pro Thr Asp Leu Phe Glu Lys Ile Glu Lys Gln Ser Val Ala 215 220 Met Thr Pro Val Met Leu Lys Ser Val Asp Ala Ile Pro Gln Thr Lys 230 235 Pro Ala Thr Ala Lys Lys Ser Ser Thr Val Arg Lys Ala Ser Val 250 Val Lys Pro Val Ala Val Lys Glu Val Lys Val Asn Gln Pro Glu Lys 260 265 Thr Met Lys Ala Thr Glu Thr Lys Val Val Glu Lys Thr Phe Pro Tyr 280 His Ile Ile Ala Ser Val Ala Asn Thr Lys Asp Ala Glu Ala Met 295 300 Ala Gly Glu Leu Lys Ala Lys Gly Tyr Thr Gly Ala Arg Val Leu Thr 310 315 Gly Asp Gly Lys Ile Arg Val Ser Ile Met Ser Cys Ala Asp Arg Glu 325 330 Asp Ala Asn Arg Gln Leu Leu Lys Leu Arg Glu Asn Glu Ala Tyr Lys 345 Asn Ala Trp Met Leu Ala Lys 355

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<213> B.fragilis

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555 550 Met Leu Lys Val Ile Lys Ser Val Lys Asn Ile Gln Gln Thr Pro Val 570 565 Gln Glu Ile Trp His Asn Asp Gly Asp Gln Val Leu Ala Tyr Gln Arg 585 580 Lys Asp Leu Val Phe Val Phe Asn Phe Asn Pro Ser Gln Ser Phe Thr 600 Asp Tyr Gly Phe Leu Val Thr Pro Gly Thr Tyr Glu Val Val Leu Asn 620 615 Thr Asp Asn Ile Ile Tyr Gly Gly Asn Gly Leu Ser Asp Asp Ser Val 635 630 Lys His Phe Thr Leu Pro Asp Pro Leu Tyr Lys Lys Glu Lys Lys Glu 650 645 Trp Leu Lys Leu Tyr Ile Pro Ala Arg Thr Ala Met Val Leu Arg Arg 665 Thr Lys

<210> 5598 <211> 381 <212> PRT <213> B.fragilis

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2378 285 280 Gly Glu Thr Tyr Leu Tyr Asp Glu Ser Val Ala Cys Ala Gly Arg Pro 300 295 Glu Gly Lys Ser Leu Glu Val Cys Ser Arg Phe Asn Tyr Leu Thr Leu 315 Asn Asp Glu Asp Ala Ser Ile Trp Gly Gly Glu Gln Lys Asp Ile Ser 330 325 Ile Gly Leu Asn Tyr Tyr Ile Asn Lys Tyr Ile Gly Ile Lys Leu Asn 345 Tyr Ser Tyr Leu Met Pro Gly Ala Ser Ile Lys Glu Ile Ser Arg Lys 360 Asn Phe Ser Val Phe Gln Gly Arg Phe Gln Phe Ile Phe 375 <210> 5599 <211> 171 <212> PRT <213> B.fragilis

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Tyr Asn Gln Ala Ile Ser Tyr Glu Ile Leu Glu

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Lys

<213> B.fragilis

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Arg Lys Tyr Val Ile Trp Gly Ser Ile Leu Gly Thr Ala Pro Phe Ser 290 295 300

Leu Leu Met Pro His Ala Gly Leu Val Trp Thr Ile Ile Leu Ser Phe 305 310 315

Cys Val Gly Leu Met Leu Ser Ser Ala Phe Pro Ala Ile Leu Leu Tyr 325 330 335

Ala Gln Glu Leu Leu Pro Asn Lys Leu Gly Leu Ile Ser Gly Leu Phe 340 345 350

Phe Gly Phe Ala Phe Gly Val Ala Gly Ile Ala Ser Ala Val Leu Gly 355 360 365

Asn Met Ala Asp Lys Phe Gly Ile Asp Ala Val Tyr Asn Val Cys Ala 370 375 380

Phe Met Pro Leu Leu Gly Leu Val Thr Trp Phe Leu Pro Asp Leu Lys 385 390 395 400

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Gln Ile Val Asn Lys Ile His Val Phe Thr Leu Val Tyr Glu Ala Met 50 55 60

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Glu Asp Gln Val Phe Asp Ile Lys Val Gly Glu Thr Leu Pro Val Leu 35 40 45

Pro Leu Arg Asn Met Val Leu Phe Pro Gly Val Phe Met Pro Val Ser 50 55 60

Val Gly Arg Lys Ser Ser Leu Arg Leu Val Arg Glu Ala Asp Lys Lys 65 70 75 80

Lys Ser Tyr Ile Ala Val Val Cys Gln Lys Met Ala Glu Thr Asp Glu 85 90 95

Pro Ala Phe Glu Asp Leu His Pro Ile Gly Thr Ile Gly Lys Ile Val 100 105 110

Arg Val Leu Glu Met Pro Asp Gln Thr Thr Thr Val Ile Ile Gln Gly
115 120 125

Met Lys Arg Leu Glu Leu Lys Asn Ile Thr Glu Thr His Pro Tyr Leu 130 135 140

Lys Gly Glu Val Asn Ile Val Glu Glu Glu Ile Pro Ser Lys Asp Asp 145 150 155 160
Lys Glu Phe Gln Ala Leu Val Glu Thr Cys Lys Asp Leu Thr Ile Arg

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				165					170					175	
Tyr	Ile	Lys	Ser 180	Ser	Asp	Thr	Leu	His 185	Gln	Glu	Ser	Ala	Phe 190	Ala	Ile
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Leu 225		Glu	Arg	Thr	Tyr 230	Arg	Leu	Leu	Glu	Ile 235	Leu	Asn	Arg	Glu	Val 240
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		275					280					285		Glu	
	290					295					300			Arg	
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				325					330					Asn 335	
			340					345					350	Ala	
-		355					360					365		Glu	
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			420					425					430	Lys	
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			580					585					590		
		595					600					605		Lys	
	610					615					620			Asp	
Tyr 625		Gly	Asn	Asp	630		Gly	Val	Val	Thr 635		Leu	Ala	Trp	Thr 640

Ala Val Gly Gly Glu Ile Leu Phe Val Glu Thr Ser Leu Ser Arg Gly 650 645 Lys Gly Gly Arg Leu Thr Leu Thr Gly Asn Leu Gly Glu Val Met Lys 665 Glu Ser Ala Met Leu Ala Leu Glu Tyr Ile Lys Ala His Ala Ser Leu 680 Leu Asn Leu Asp Glu Glu Ile Phe Asp Asn Trp Asn Ile His Val His 700 695 Val Pro Glu Gly Ala Ile Pro Lys Asp Gly Pro Ser Ala Gly Ile Thr 715 710 Met Ala Thr Ser Leu Ala Ser Ala Leu Thr Gln Arg Lys Val Lys Ala 725 730 Asn Leu Ala Met Thr Gly Glu Ile Thr Leu Arg Gly Lys Val Leu Pro 740 745 Val Gly Gly Ile Lys Glu Lys Ile Leu Ala Ala Lys Arg Ala Gly Ile 760 Lys Glu Ile Ile Met Ser Ala Glu Asn Lys Lys Asn Ile Asp Glu Ile 775 Gln Asp Ile Tyr Leu Lys Gly Leu Thr Phe His Tyr Val Asn Asp Val 795 790 Lys Glu Val Phe Ala Ile Ala Leu Thr Gln Glu Lys Val Ala Asp Ala 810 805 Ile Asp Leu Ser Val Lys Lys Ala Ser Gln Glu <210> 5604 <211> 65 <212> PRT <213> B.fragilis <400> 5604 Gln Ile Ile Tyr Ile Thr Leu Asn Ile Gly Cys Arg Leu Phe Leu Leu Ser Lys Asp Glu Lys Gln Ser Leu Asn Ile Glu Leu Ser Arg Glu Glu 25 Ile Glu Tyr Phe Phe Lys Pro Tyr Pro Ala Asp Glu Thr Glu Ala Tyr Glu Ile Cys Asn Asp Phe Ile Lys Lys Ile Ser Thr Asp Lys Ser Ile 55 Leu 65 <210> 5605 <211> 70 <212> PRT <213> B.fragilis <400> 5605 Tyr Ile Ile Tyr Tyr Gln Arg Phe Ile Leu Leu Trp Glu Gln Gly Val Val Gly Ser Asn Pro Ala Thr Pro Thr Gly Asn Lys Ser Asn His Thr Cys Gln Cys Gly Tyr Ser Tyr Phe Ile Leu Cys Tyr Gly Gly Ile Pro Ile Ile Arg Asn Asp Ala Thr Gly Thr Glu Arg Arg Leu Leu His Phe Gln Ile Lys Leu Pro Gly

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Gln Thr Ala Thr Leu Gln Ile Met Asn Leu Tyr Gln Leu Pro Gln Leu
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Lys Gln Phe Cys Asp Ser Val Phe Ser Val Ile Asn Arg Glu His Val
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Pro Asn Leu Val Ile Asp Val Arg Asn Asn Lys Gly Gly Ser Ser Ala
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Gly Val Asp Met Leu Leu Ser Tyr Leu Ser His Asp Ala Tyr Thr Leu
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Tyr Ile Lys Thr Asp Leu Lys Ile Ser Ser Tyr Ser Lys Arg Tyr Asn
                            120
Glu Gln Lys His Pro Glu Thr Tyr Glu Glu Ile Lys Asn Leu Pro Asp
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Gly Ser Leu Phe Ala Ile Arg Asp Ser Phe Val Glu Gly Asn Arg Asp
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                    150
Lys Ala Asp Ile Tyr Lys Gly Ser Val Thr Val Leu Val Asn Glu Ser
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Thr Tyr Ser Gly Ala Ser Thr Phe Ala Ser Ala Ile Lys Lys Ser His
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Ala Gly Lys Val Leu Gly Glu Thr Gly Cys Pro Thr Val Tyr Phe Gly
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Asn Tyr Met Ser Phe Thr Leu Pro Asn Ser Arg Leu Glu Tyr Tyr Ile
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Ser Leu Asn Lys Phe Tyr Glu
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Val Phe Val Cys Glu His Cys Gly Lys Gln Phe Ser Ile Arg Leu Gly
Lys Ser Lys Met Lys Ala Pro Arg Lys Glu Glu Lys Leu Asp Glu Asp
                        55
Val Tyr Lys Glu Glu Phe Gly Cys Ile Val Val Ile Glu Asn Val Phe
Gly Phe Lys Gln Val Leu Pro Leu Gln Glu Gly Asp Asn Ile Ile Gly
                                     90
                85
Arg Arg Cys Val Gly Thr Asp Ile Asn Thr Pro Ile Glu Thr Gly Asp
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Met Ser Met Asp Arg Arg His Cys Ile Ile Asn Val Lys Arg Asn Arg
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Gln Gly Lys Leu Val Tyr Thr Leu Arg Asp Ala Pro Ser Leu Thr Gly 130 135 140
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Thr Phe Leu Met Asn Glu Ile Leu Gly Asp Lys Asp Arg Ile Arg Ile 145 150 155 160

Asp Asp Gly Ala Ile Ile Thr Ile Gly Ala Thr Thr Leu Ile Leu Arg 165 170 175

Ala Ala Lys Lys Glu Glu Ile 180

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Glu Arg Arg Tyr Glu Met Gly Arg Ile Lys Glu Glu Ala Trp Val Glu 1 5 10 15

Lys Cys Thr Val Leu His Glu Gly Lys Ala Thr Pro Asn Ile Tyr Tyr 20 25 30

Asn Val Phe Ala Asp Gly Glu Gln Leu Cys Glu Ile Ser Tyr Asp Arg 35 40 45

Leu Ile Ala Ile Arg Asn Leu Ile Asn Gln Ile Glu Lys Glu Lys Lys 50 55 60

Gly Glu Cys His Glu

65

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Pro Asn His Leu Met Asp Ile Ile Asp Arg Ile Lys Gln Tyr Leu Asn 1 5 10 15

His Lys Gly Ile Ser Asp Tyr Arg Phe Glu Lys Thr Leu Ser Leu Ser 20 25 30

Lys Gly Tyr Ile Asn Lys Ala Lys Asn Pro Thr Ala Asp Ile Leu Met

Lys Met Cys Gly Ile Tyr Thr Asp Ile Ser Thr Glu Trp Leu Leu Arg 50 55 60

Gly Glu Gly Glu Met Leu Arg Glu Lys Arg Glu Asp Leu Gly Leu His 65 70 75 80

Arg Ala Glu Ser Ala Ser Thr Asp Glu Asn Ser Leu Ile Tyr Lys Met 85 90 95

Tyr Lys Glu Lys Asp Asp Glu Asn Lys Thr Leu Ile Lys Gln Asn Ala 100 105 110

Val Leu Glu Glu Arg Ile Arg Gln Leu Glu Ala Asp Asn Glu Ser Leu
115 120 125

Arg Ser Gln Ser Gly Ala Asp Arg Ile Thr Asp Thr Phe Ser Asp Leu 130 135 140

Pro Leu Val Asp Tyr Glu Glu Asp Tyr Pro Pro Val Glu Arg Pro Ser 145 150 155 160

Ser Ser Lys His Pro Leu Ala Gly Lys Ala 165 170

<210> 5610

<211> 192

<212> PRT

<213> B.fragilis

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գլոր գլութ, որ գրութ ու բրուր որ գրու գրութ ուսությունը որ գրությունը գրությունը գրությունը գրությունը գրությո
գլությանը գրությունը գրությունը գրությունը գրությունը գրությունը գրությունը գրությունը գրությունը գրությունը գ
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55 Ile Phe Asp Tyr Tyr Met Asn Phe Ile Pro Tyr Phe Ala Asn Leu Phe 75 70 Ser Pro Leu Phe Val Phe Ile Ala Val Ile Phe Phe Thr Ser Lys Leu 90 85 Ala Glu Asn Ser Glu Ile Ile Ala Met Phe Ser Thr Gly Met Ser Phe 105 Lys Arg Met Leu Arg Pro Tyr Met Ile Ser Ala Gly Ile Ile Ala Ile 120 Ser Thr Phe Ile Leu Gly Ser Tyr Val Ile Pro Arg Gly Ser Val Thr 135 140 Arg Leu Asp Phe Glu Asp Lys Tyr Val Lys Lys Lys Thr Thr Tyr 155 150 Val His Asn Ile Gln Leu Glu Ile Asp Thr Gly Val Ile Ala Tyr Ile 170 Asp Asn Tyr Gln Asp Tyr Asn Lys Thr Gly Asn Arg Phe Ser Leu Asp 185 180 Lys Phe Val Asp Lys Lys Leu Val Ser His Leu Thr Ala Arg Ser Ile 200 Thr Tyr Asp Thr Thr Ala Val Asn Lys Trp Thr Ile Lys Asp Tyr Met 215 Ile Arg Asn Leu Asp Gly Leu Lys Glu Thr Ile Val Arg Gly Asp Lys 235 230 Met Asp Ser Ile Ile Pro Met Glu Pro Ala Asp Phe Met Ile Met Arg 250 245 Asn Gln Gln Glu Met Leu Thr Ser Pro Gln Leu Ser Ala Tyr Ile Asp 265 Lys Gln Lys Gln Arg Gly Ile Ala Asn Ile Lys Glu Phe Glu Ile Glu 285 280 275 Tyr His Lys Arg Ile Ala Met Ser Phe Ala Ser Phe Ile Leu Thr Val 300 295 Ile Gly Val Ser Leu Ser Ser Arg Lys Thr Lys Gly Gly Met Gly Leu 310 315 His Leu Gly Ile Gly Leu Gly Leu Ser Phe Ser Tyr Ile Leu Phe Gln 330 325 Thr Val Ala Ser Thr Phe Ala Val Asn Gly Asn Met Pro Pro Met Ile 340 345 Ala Met Trp Ile Pro Asn Leu Leu Tyr Ala Leu Ile Ala Phe Tyr Leu 360 Tyr Arg Lys Ala Pro Lys 370 <210> 5616 <211> 81 <212> PRT <213> B.fragilis <400> 5616 Gly Leu Ser His Leu His Ser Phe Leu Ser Ser Ile Phe Gly Phe Gly Leu Ala Gly Val Leu Leu Thr Lys Tyr Cys Pro Asp Pro Thr Leu Phe 25 Glu Ser Arg Glu Ala Trp Glu Val Ala Ser Val Asn Ala His Tyr Ile

Leu Ala Gly Val Leu Leu Thr Lys Tyr Cys Pro Asp Pro Thr Leu Phe 20 25 30

Glu Ser Arg Glu Ala Trp Glu Val Ala Ser Val Asn Ala His Tyr Ile 35 40 45

Trp Tyr Tyr Phe Ala Ala Ile Gly Leu Val Ala Ala Ile Ala Leu Leu 50 55 60

Ile Phe Ala Lys Ile Thr Asp Phe Ile Asp Lys Lys Lys Thr Asn 65 70 75 80

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415 405 410 Glu Gln Thr Tyr Val Asn Val Asn Ile His Gln Lys Glu Asn Ala Asp 425 420 Lys Leu Lys Ala Leu Ala Gln Leu Pro Asp Ser Cys Ala Ala Ser Ala 440 Asp Cys Leu Gln Lys Gln Arg Thr Val Phe Glu Gln Tyr Asn Val Phe 460 455 Ser Pro Ala Met Ile Asp Gly Ile Ile Ser Arg Leu Arg Ser Tyr Asn 475 470 Asp Ala Thr Leu Arg Lys Asp Ile Gln Asp Lys Pro Glu Glu Met Leu 485 490 Ala Leu Val Ser Lys Phe Phe His Cys Gly 500

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Asn Met Asp Gln Leu Gln Leu Ile Gln Ser Lys Ile Tyr Glu Ile Arg 10 Gly Gln Lys Val Met Leu Asp Phe Asp Leu Ala Glu Met Tyr Gly Thr 25 Glu Thr Lys Tyr Leu Lys Arg Ser Val Lys Asn Asn Ile Lys Arg Phe 40 Pro Ser Asp Phe Met Phe Glu Leu Thr Lys Glu Glu Phe Asp Ser Leu 60 55 Arg Cys Ser Phe Ser Thr Ser Lys Arg Gly Gly Thr Arg Tyr Met Pro 75 70 Tyr Ala Phe Thr Glu His Gly Val Ala Gln Leu Ser Ser Val Leu Asn 90 85 Ser Asp Leu Ala Ile Glu Ile Asn Ile Gln Ile Ile Arg Ala Phe Ile 105 Ala Val Arg Gln Leu Ile Ser Asn Pro Pro Val Asp Arg Val Asp Lys 125 120 Leu Lys Glu Glu Ile Lys Ala Leu Lys Asp Tyr Ile Glu Glu Ala Phe 140 135

Thr Asp Tyr Asn Asp Ile Asn Asp Asp Thr Arg Met Gln Leu Glu Leu 145 150 155 160

Ile Asn Gln Thr Leu Ala Glu Leu Gln Ala Lys Lys Lys Ala Glu Glu 165 170 175

Lys Pro Arg Asn Pro Ile Gly Phe Ile Lys Pro Lys His
180 185

<210> 5619 <211> 76 <212> PRT <213> B.fragilis

<400> 5619

Phe Gln Gln Ile Asp Tyr Tyr Lys Asp Ser Gly Gln 65 70 75

<210> 5620

<211> 333

<212> PRT

<213> B.fragilis

<400> 5620

Ile Val Lys Gln Arg Ile Met Gln Phe Tyr Ser Arg Asn Glu Ala Ile

5 10 15

Asn Arg Ile Asn Lys Leu Ala Gly Ala Gly Lys Ala Phe Leu Phe Ile 20 25 30

Ile Asp Tyr Lys Gln Glu Cys Ser Phe Ile Glu Lys Val Asp Asp Ile 35 40 45

Asp Ser Ser Glu Leu Leu Tyr Asn Leu Asn Gly Phe Thr Asn Cys Thr 50 55 60

Ser Val Val Thr Pro Phe Arg Tyr Pro Ile Ile Trp Gln Pro Gln Pro 65 70 75 80

Ile Ser Leu Ser Gln Tyr Lys Arg Ser Phe Asp Ile Ile Arg Lys Asn 85 90 95

Ile Leu Ser Gly Asn Ser Phe Leu Thr Asn Leu Thr Cys Met Thr Pro 100 105 110

Val Asn Thr Asn Leu Gly Leu Lys Asp Ile Phe Tyr His Ser Arg Ala

Leu Tyr Lys Leu Trp Leu Lys Glu Thr Phe Val Val Phe Ser Pro Glu
130 135 140

Ile Phe Ile Arg Ile Glu Asn Gly Arg Ile Ser Ser Tyr Pro Met Lys 145 150 155 160

Gly Thr Ile Asp Ala Thr Leu Pro Ser Ala Thr Arg Leu Leu Met Glu 165 170 175

Asp Glu Lys Glu Ala Ala Glu His Ala Thr Ile Val Asp Leu Ile Arg 180 185 190

Asn Asp Leu Ser Ile Val Ala Asp Asn Val Ser Val Thr Arg Tyr Arg 195 200 205

Tyr Val Asp Thr Leu Tyr Thr Asn His Gly Pro Ile Leu Gln Thr Ser 210 215 220

Ser Glu Ile Ser Gly Val Leu Pro Lys Asn Tyr Val Asp His Leu Gly 225 230 235 240

Glu Ile Leu Phe Arg Leu Leu Pro Ala Gly Ser Ile Thr Gly Ala Pro
245 250 255

Lys Tyr Lys Thr Ile Glu Ile Ile Glu Gln Ala Glu Glu Tyr Glu Arg 260 265 270

Gly Phe Tyr Thr Gly Ile Thr Gly Tyr Phe Asp Gly Arg Lys Leu Asp 275 280 285

Ser Ala Val Met Ile Arg Phe Ile Glu Glu Gln Asn Gly Gln Ile Phe 290 295 300

Phe Lys Ser Gly Gly Gly Ile Thr Cys Lys Ser Asp Leu Glu Asn Glu 305 310 315

Tyr Asn Glu Met Lys Gln Lys Val Tyr Val Pro Ile Tyr 325 330

<210> 5621

<211> 178

<212> PRT

<213> B.fragilis

<400> 5621

Thr Met Lys His Wal His Leu Ile Ile Tyr Phe Ala Cys Ile Ser

10 Val Gly Ile Leu Leu Cys Ala Cys Arg Ser Ser Ser Leu His Ser Asn 25 Gln Phe Lys Glu Asn Gly Thr Phe Gln His Asn Tyr Asn Glu Leu Asn Thr Gly Thr Gly Thr Ile Ala Ser Gln Val Lys Thr Thr Lys Asp Glu 55 His Gly Ser Ser Trp Lys Ile Thr Tyr His Phe Asp Thr Ala Gln Thr Pro Asp Pro Thr Thr Gly Leu Pro Pro Leu Ser Gly Ile Glu Ile Glu 90 Gly Ser Glu Lys Gln Ser Lys Thr Ala Gln Glu Ser Asn Asp Thr Val 105 His Ser Ser Asn Ser Ser Ser Lys Arg Glu Val Ser Gly Gln Thr Ile 125 120 Gln Arg Glu Ser Gly Thr Glu Thr Lys Lys Asp Ser Lys Val Ala Thr 135 140 Gly Thr Asp Asp Gly Ile Arg Asn Gly Leu Ser Ile Gly Ile Pro Leu 155 150 Leu Phe Ile Ile Ile Ala Leu Ser Tyr Tyr Ala Lys Arg Gln Asn Thr 170 Ser Lys

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<400> 5622

Val Ile Leu His Lys Ile Lys Gln Met Ile Lys Tyr Ile Ala Thr Leu 10 Leu Leu Thr Val Leu Phe Val Ala Cys Asn Asn Gly Lys Gly Gln Gln 25 Pro Ser Glu Glu Asn Glu Asp Pro Lys Ala Lys Glu Ile Leu Gln Gly Ile Trp Leu Asp Asp Glu Thr Glu Thr Pro Leu Met Arg Ile Ile Gly 55 Asp Thr Ile Tyr Tyr Ser Asp Ala Gln Ser Ala Pro Val Tyr Phe Lys 75 70 Ile Leu Lys Asp Thr Leu Tyr Thr Tyr Gly Lys Asp Val Thr His Tyr 85 90 Gln Ile Asp Lys Gln Ser Glu Tyr Ser Phe Trp Phe His Ser Leu Ala 105 Asp Asn Ile Ile Lys Leu His Lys Ser Glu Asp Pro Asn Asp Thr Leu 120 Ala Phe Ser Phe Lys Ser Val Glu Ile Ile Pro Thr Tyr Thr Glu Val 140 135 Thr Lys Lys Asp Ser Val Val Met Phe Asp Gly Val Arg Tyr Arg Ala 155 150 Tyr Val Tyr Ile Asn Pro Ser Gln Met Lys Val Val Lys Thr Thr Tyr 170 Ser Glu Asp Gly Ile Ser Met Asp Asn Ile Tyr Tyr Asp Asn Val Met 185 180 His Ile Cys Val Tyr Glu Gly Lys Lys Ser Leu Tyr Ala Lys Asp Ile 200 Thr Lys Gln Met Phe Val Asp Val Ile Pro Thr Asp Phe Leu Gln Gln 220 215 Ala Ile Leu Ser Asp Met Asn Phe Thr Gly Ile Asp Arg Lys Gly Tyr

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2392
                                        235
                   230
His Tyr Gln Ala Leu Val Cys Ile Pro Glu Ser Pro Val Cys Asn Leu
                                    250
               245
Val Asn Leu Thr Ile Ser Phe Asp Gly Lys Leu Asn Ile Thr Ala Ala
                                265
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275
<210> 5623
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Lys Tyr Lys

225

<211> 126 <212> PRT

<213> B.fragilis

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Asn His Phe Asn Thr Leu Asn Tyr Leu Ile Met Gly Leu Asp Ile Ala 10

Ile Ala Ser Ala Val Val Glu Ile Ile Thr Leu Ile Phe Phe Val

Leu Cys Arg Asn Val Ser Lys Ile Lys Lys Glu Ile Val Ser Asn Asp

Asn Leu Pro Gly Met Phe Ala Met Tyr Ile Ser Leu Gly Glu Thr Asp 55

Lys Ala Lys Lys Ile Leu Tyr Lys Ala Ile Ser Lys Glu Pro Glu Phe 75

Ile Ala Ala Phe Cys Tyr Asn Gly Asn Asn Ser Ala Gln Gln Ser Thr 90 85

Leu Lys Arg Lys Tyr Lys Pro Tyr Leu Glu Ile Leu Gly Leu Glu Leu 105

Asp Phe Glu Leu Val Asn Lys Phe Ile Gln Glu Arg Glu Lys 120 115

<210> 5624

<211> 470

<212> PRT

<213> B.fragilis

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Val Ile Ile Lys Asn Arg Ile Leu Ile Ile Pro Ala Phe Phe Leu Leu 10

Pro Lys Arg Arg Lys Gly Lys Ala Pro Lys Ile Leu Asn Lys Met 25

Ala Thr Lys Glu Tyr Phe Pro Gly Ile Gly Lys Ile Lys Phe Glu Gly 40

Lys Asp Ser Lys Asn Pro Met Ala Phe Arg Tyr Tyr Asp Ala Glu Lys 60

Met Ile Asn Gly Arg Ser Met Lys Asp Trp Leu Lys Phe Ala Met Ala 75 70

Trp Trp His Thr Leu Cys Ala Glu Gly Gly Asp Gln Phe Gly Gly 90

Thr Lys Gln Phe Pro Trp Asn Gly Asp Pro Asp Pro Val Gln Ala Ala 105

Lys Asn Lys Met Asp Ala Gly Phe Glu Phe Met Gln Lys Met Gly Ile 125 120

Gly Tyr Tyr Cys Phe His Asp Val Asp Leu Val Thr Glu Ala Asp Ser 140 135

Ile Glu Ala Tyr Glu Ala Asn Leu Lys Glu Leu Val Ala Tyr Ala Lys

155 150 Gln Lys Gln Ala Glu Thr Gly Ile Lys Leu Leu Trp Gly Thr Ala Asn 170 165

2393 Val Phe Ser His Ala Arg Tyr Met Asn Gly Ala Ala Thr Asn Pro Asp 185 Phe Asp Val Val Ala Arg Ala Ala Val Gln Ile Lys Asn Ala Ile Asp 200 Ala Thr Ile Glu Leu Gly Gly Thr Asn Tyr Val Phe Trp Gly Gly Arg 215 Glu Gly Tyr Met Ser Leu Leu Asn Thr Asp Gln Lys Arg Glu Lys Glu 230 235 His Leu Ala Gln Met Leu Thr Ile Ala Arg Asp Tyr Gly Arg Ala Arg 250 245 Gly Phe Lys Gly Thr Phe Leu Ile Glu Pro Lys Pro Met Glu Pro Thr 260 265 Lys His Gln Tyr Asp Val Asp Thr Glu Thr Val Ile Gly Phe Leu Lys 280 Ala His Gly Leu Asp Gln Asp Phe Lys Val Asn Ile Glu Val Asn His 300 295 Ala Thr Leu Ala Gly His Thr Phe Glu His Glu Leu Ala Val Ala Val 315 310 Asp Asn Gly Met Leu Gly Ser Ile Asp Ala Asn Arg Gly Asp Tyr Gln 330 325 Asn Gly Trp Asp Thr Asp Gln Phe Pro Ile Asp Asn Phe Glu Leu Thr 345 340 Gln Ala Met Met Gln Ile Ile Arg Asn Asp Gly Leu Gly Asn Gly Gly 360 365 Thr Asn Phe Asp Ala Lys Thr Arg Arg Asn Ser Thr Asp Pro Glu Asp 375 Ile Phe Ile Ala His Ile Ala Gly Met Asp Ala Met Ala Arg Ala Leu 395 390 Glu Ser Ala Ala Asn Leu Leu Asn Glu Ser Pro Tyr Gln Lys Met Leu 410 405 Ser Asp Arg Tyr Ala Ser Phe Asp Ala Gly Lys Gly Lys Glu Phe Glu 425 Glu Gly Lys Leu Ser Leu Glu Glu Leu Val Ala Tyr Ala Lys Ala Asn 440 435 Gly Glu Pro Lys Gln Thr Ser Gly Gln Gln Glu Leu Tyr Glu Ala Leu 455 Val Asn Ile Tyr Ser Leu <210> 5625 <211> 198 <212> PRT <213> B.fragilis <400> 5625

Met Ile Tyr Asn Ile Asn Val Ile Thr Asn Asn Lys Phe Ser Met Lys 10

Lys Asn Arg Leu Thr Leu Val Ala Ala Ile Phe Leu Ser Gly Thr Ile 25

Leu Phe Ser Ser Cys Val Gly Ser Phe Gly Leu Phe Asn Arg Ile Ser

Ser Trp Asn Gln Ser Ile Gly Thr Lys Phe Val Asn Glu Leu Val Phe

Leu Ala Leu Asn Ile Val Pro Val Tyr Gly Val Ala Tyr Leu Ala Asp 70 75 Ala Leu Val Ile Asn Ser Ile Glu Phe Trp Ser Gly Thr Asn Pro Met

90 Ala Asn Val Gly Asp Val Lys Lys Val Lys Gly Glu Asn Gly Asp Tyr 105 100

2394

Leu Val Lys Thr Leu Glu Asn Gly Tyr Ser Ile Thr Lys Glu Gly Glu 120 Asp Ser Ala Met Glu Leu Ile Tyr Asn Lys Glu Ala Asn Thr Trp Asn 135 140 Val Val Ala Asp Gly Val Ser Thr Glu Leu Leu Lys Met Asn Asp 155 150 Gly Thr Ala Glu Met Asn Leu Pro Asn Gly Asp Lys Met Asn Val Thr 165 170 Leu Asp Ala Gln Gly Met Met Ala Ala Arg Gln Ala Thr Met Gly Gly 185 180 Leu Leu Phe Ala Ala Arg 195

<210> 5626

<211> 510

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<213> B.fragilis

<400> 5626

Thr Thr Asn Lys Leu Ile Asn Ser Ile Met Phe Leu Leu Gly Tyr Asp 1 5 10 15

Ile Gly Ser Ser Ser Val Lys Ala Ser Leu Val Asp Ala Glu Thr Gly 20 25 30

Lys Cys Val Ala Ser Ala Phe Phe Pro Lys Thr Glu Ala Gly Ile Ile

Lys Cys Val Ala Ser Ala Phe Phe Pro Lys Thr Glu Ala Gly IIe IIe
35
40
45

Ala Ile Arg Pro Gly Trp Ala Glu Gln Glu Pro Glu Ser Trp Trp Glu 50 55 60
Ser Leu Lys Leu Ser Thr Arg Ser Ile Leu Ser Glu Ser Arg Val Asp

65 70 75 80
Ala Lys Asp Ile Lys Ala Ile Gly Ile Ser Tyr Gln Met His Gly Leu
85 90 95

Val Cys Val Asp Lys Arg Gln Arg Thr Leu Arg Pro Ala Ile Ile Trp
100 105 110

Cys Asp Ser Arg Ala Val Ser Tyr Gly Gln Arg Ala Phe Glu Ala Ile 115 120 125

Gly Glu Lys Phe Cys Leu Ala His Leu Leu Asn Ser Pro Gly Asn Phe 130 135 140

Glu Gln Ile Asp Lys Ile Met Leu Pro Gly Asp Tyr Ile Ala Met Lys 165 170 175 Leu Ser Gly Glu Val Cys Thr Thr Ile Glu Gly Leu Ser Glu Gly Met

180 185 190
Phe Trp Asp Phe Arg Asn Asn Arg Pro Ala Asp Phe Leu Met Gln Tyr

195 200 205

Tyr Gly Ile Asp Pro Ser Leu Ile Ala Asp Ile Arg Pro Thr Phe Ala
210 215 220

Glu Gln Gly Arg Leu Thr Gly Thr Ala Ala Arg Glu Leu Gly Leu Gln 225 230 235 240

Glu Gly Thr Pro Ile Thr Tyr Arg Ala Gly Asp Gln Pro Asn Asn Ala 245 250 255

Leu Ser Leu Asn Val Phe Asn Pro Gly Glu Ile Ala Ser Thr Ala Gly
260 265 270

Thr Ser Gly Val Val Tyr Gly Val Asn Gly Glu Ile Asn Tyr Asp Pro

275 280 285

Gln Ser Arg Val Asn Thr Phe Ala His Val Asn His Thr Ala Ala Asp
290 295 300

Pro Arg Leu Gly Val Leu Leu Cys Ile Asn Gly Thr Gly Ile Leu Asn 305 310 315 320

Ser Trp Ile Arg Arg Asn Val Ala Pro Glu Gly Ile Ser Tyr Ala Glu 325 330 335

Met Asn Arg Phe Ala Ser Ser Val Pro Ile Gly Ser Ala Gly Ile Ser 340 345 350

Ile Leu Pro Phe Gly Asn Gly Ala Glu Arg Met Leu Asp Asn Arg Ala 355 360 365

Thr Gly Cys Gly Ile His Gly Val Asp Phe Asn Arg His Asp Lys Ser 370 375 380

His Leu Ile Arg Ala Ala Gln Glu Gly Ile Val Phe Ser Phe Lys Tyr 385 390 395 400

Gly Ile Asp Ile Met Glu Glu Met Gly Ile Pro Val Lys Lys Ile His
405 410 415

Ala Gly His Ala Asn Met Phe Leu Ser Ser Val Phe Arg Glu Thr Leu 420 425 430

Ala Gly Thr Thr Gly Ala Thr Ile Glu Leu Tyr Asp Thr Asp Gly Ser 435 440 445

Val Gly Ala Ala Lys Gly Ala Gly Met Gly Ala Gly Ile Tyr Lys Asp 450 455 460

His Glu Glu Ala Phe Ala Thr Leu Asp Lys Leu Thr Val Val Glu Pro
465 470 480

Asp Ala Gly Lys Gln Gln Glu Tyr Thr Asp Ala Tyr Ala Arg Trp Lys
485 490 495

Gln Cys Leu Thr Gln Ser Met Gln Thr Glu Thr Glu Asn Lys 500 505 510

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<211> 84

<212> PRT

<213> B.fragilis

<400> 5627

Ala Met Asn Lys Gln Met Thr Ile Ala Lys Lys Arg Tyr Ser Phe Lys 1 5 10 15

Lys Ala Tyr Glu Arg Val Pro Leu Gly Gln Ile Glu Ser Leu Lys Lys
20 25 30

Glu Leu Tyr Ser Val Phe Ser Ile Asn Asn Arg Thr Ser Trp Tyr Asn 35 40 45

Lys Leu Lys Gly Ile Thr Ser Pro Ser Ile Glu Val Val Glu Ala Val 50 55 60

Glu Thr Val Phe Leu Lys Tyr Gly Ile Glu Asn Cys Trp Glu Ile Thr 65 70 75 80

Glu Ile Lys Leu

<210> 5628

<211> 78

<212> PRT

<213> B.fragilis

<400> 5628

Ser Glu Asp Asn Gln Ser His Ile Tyr Leu Leu Cys Phe Ser Arg Ser 1 5 10 15

Leu Thr Ala Gly Met His Ile Ile Lys Ile Glu Val Asn Thr Ile Ala 20 25 30

Ile Pro Gln Gln Ile Lys Ile Leu Ala Ile Pro Lys Leu Ser Ala Ile 35 40 45

Asn Pro Val Met Asn Asn Pro Met Ile Glu Gly Asn Lys Leu Thr Leu 50 55 60

Ser Lys Arg Glu Asn Thr Arg Pro Lys Tyr Ala Gly Leu Asn

<210> 5629

75

 <211> 385 <212> PRT <213> B.fragilis <400> 5629 Phe Ile Arg Lys Glu Ser Gln Pro Gly Met Thr Phe Glu Leu Gln Tyr 10 Thr Asp Ala Lys Ser Asn Ala Arg Ala Gly Leu Ile Thr Thr Asp His 25 Gly Gln Ile Gln Thr Pro Ile Phe Met Pro Val Gly Thr Ile Gly Ser 40 Val Lys Gly Val His Gln Thr Glu Leu Lys Glu Asp Ile Gln Ala Gln 55 Ile Ile Leu Gly Asn Thr Tyr His Leu Tyr Leu Arg Pro Gly Leu Asp Val Leu Glu Lys Ala Gly Gly Leu His Lys Phe Asn Gly Phe Asp Arg 90 Pro Met Leu Thr Asp Ser Gly Gly Phe Gln Val Phe Ser Leu Ser Gly 105 Ile Arg Lys Leu Arg Glu Glu Gly Ala Glu Phe Arg Ser His Ile Asp 125 120 Gly Ser Lys His Ile Phe Thr Pro Glu Lys Val Met Asp Ile Glu Arg 135 Ile Ile Gly Ala Asp Ile Met Met Ala Phe Asp Glu Cys Pro Pro Gly 155 150 Asp Ser Asp Tyr Ala Tyr Ala Lys Lys Ser Leu Gly Leu Thr His Arg 170 165 Trp Leu Asp Arg Cys Ile Gln Arg Phe Asn Glu Thr Glu Pro Lys Tyr 185 Gly Tyr Ser Gln Ser Leu Phe Pro Ile Val Gln Gly Cys Val Tyr Pro 205 200 Asp Leu Arg Lys Gln Ser Ala Glu Tyr Ile Ala Ser Lys Asp Ala Asp 220 215 Gly Asn Ala Ile Gly Gly Leu Ala Val Gly Glu Pro Val Asp Lys Met 235 230 Tyr Glu Met Ile Glu Leu Val Asn Glu Ile Leu Pro Lys Asp Lys Pro 250 245 Arg Tyr Leu Met Gly Val Gly Thr Pro Val Asn Ile Leu Glu Gly Ile 265 Glu Arg Gly Val Asp Met Phe Asp Cys Val Met Pro Thr Arg Asn Gly 280 Arg Asn Gly Met Leu Phe Thr Lys Asp Gly Ile Met Asn Met Arg Asn 295 300 Lys Lys Trp Glu Ala Asp Phe Ser Pro Ile Glu Ala Asp Gly Ala Ser 315 310 Tyr Val Asp Thr Leu Tyr Ser Lys Ala Tyr Leu Arg His Leu Phe His 330 Ala Gln Glu Leu Leu Ala Met Gln Ile Ala Ser Ile His Asn Leu Ala 345 340 Phe Tyr Leu Trp Leu Val Gly Glu Ala Arg Lys His Ile Ile Ala Gly 365 Asp Phe Ser Thr Trp Lys Pro Met Met Val Lys Arg Val Ser Thr Arg 375 Leu 385

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Leu Lys Ser Lys Lys Gln Val Met Lys Lys Phe Phe Arg Phe Gln Leu
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Cys Cys Ile Cys Leu Leu Val Leu Ile Val Ser Ala Cys Lys Val Lys
                                25
           20
Arg Pro Asp Ser Val Ile Ser Glu Ser Glu Met Glu Asn Leu Leu Tyr
                           40
Asp Tyr His Ile Ala Lys Ala Met Gly Glu Asn Met Pro Gly Gly Glu
                        55
Asn Tyr Lys Lys Ala Leu Tyr Val Glu Ala Val Phe Lys Lys Tyr Gly
                                        75
                   70
Thr Thr Glu Glu Val Phe Asp Ser Ser Met Val Trp Tyr Thr Arg Asn
                85
                                    90
Thr Lys Ile Leu Ser Glu Ile Tyr Glu Lys Val Asn Lys Arg Leu Lys
                                105
Ala Gln Gln Asn Ala Ile Asn His Leu Ile Ala Leu Arg Asp Asn Lys
                            120
Pro Lys Met Ser Ala Pro Gly Asp Ser Ile Asp Val Trp Ala Trp Gln
                       135
Arg Ile Ala Gln Leu Thr Glu Ala Pro Leu Asn Asn Lys Phe Thr Phe
                                       155
                    150
Thr Leu Pro Ser Asp Thr Asn Phe Lys Lys Arg Asp Val Leu Leu Trp
               165
                                   170
Lys Met Gln Tyr Asn Phe Leu Ser Glu Ile Pro Asp Ser Thr Met Ala
           180
                                185
Pro Ile Met Ala Met Gln Ile Val Tyr Glu Asn Asp Thr Val Thr His
                                                205
                            200
Ser Cys Val Lys His Ile Phe Lys Ser Gly Ile Gln Asn Ile Arg Leu
                                            220
                        215
Gln Ser Asp Thr Met Asn Ile Lys Glu Ile Lys Gly Phe Ile Phe Cys
                                        235
                    230
Pro Leu Ser Glu Glu Ser Ile Thr Leu Leu Val Ser Asp Ile Ser Leu
                245
                                    250
Thr Arg Tyr His Ala Asn Asp Ser Ile Thr Gln Ile Gly Arg Asp Ser
                                265
            260
Leu Lys Thr Asp Ser Ile Lys Glu Lys Ser Lys Asp Asp Ser Ile Gln
                                                285
                            280
Lys Lys Thr Pro Lys Asp Thr Ile Gln Ala Ser Ser Pro His Gln Arg
                                             300
                        295
Thr Asn Pro Asn Asp Leu Asn Arg Pro Asn Asn Asp Val Arg Pro Ile
                    310
                                        315
Lys Pro Glu Gln Arg Glu Lys Glu Met Gln Ile Glu Lys Glu Lys Gln
                                    330
                325
Gln Leu Glu Arg Gln Gln Arg Thr Asn Pro Arg Arg Pro Leu Arg Arg
                                345
                                                     350
Gln Asn Asn
        355
<210> 5631
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Leu Leu Ile Asn Gly Ser Arg Val Arg Val Pro Glu Gly Val Gln Lys

Glu Ile Ile Asn Asn Leu Leu Phe Val Phe Gly Gly Ile Leu Lys Tyr

Cys Phe Ile Phe Ala Thr Ala Lys Ile Asn Leu Met Lys Thr Thr Tyr 40

Gln Phe Asn Ile Leu Val Asn His Leu Glu Leu Ala 55

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<212> PRT

<213> B.fragilis

<400> 5632

Tyr Ile Pro Asn Lys Gln Asp Ile Ser Leu Ile Ile Asn Ile Asn Phe

Ile Ile Met Asn Phe Asp Leu Lys Ala Phe Arg Lys Arg Phe Gly Leu

Lys Gln Val Glu Val Ala His Leu Phe Asn Cys Gly Gln Ser Asn Ile

Ser Asp Ile Glu Thr Gly Lys Arg Gly Leu Glu Glu Tyr Gln Thr Arg 55

Ile Leu Phe Asp Lys Tyr Gly Glu Glu Val Val Lys Glu Tyr Leu Ile

Pro Glu Ser Ala Ile His Gln Gly Asn Ile Asn Gly Asp Asn Ile Asn 90 85

Gly His Asn Val Thr Val Asn Lys Ala Asp Phe Asp Lys Leu Ile Ser 105

Leu Leu Asn Lys Arg Asp Glu Gln Ile Asp Arg Leu Leu Arg Ile Ile 120 115

Glu Asn Leu Asn Lys

130

<210> 5633

<211> 206

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Glu Arg Asn Asn Ile Met Thr Leu Lys Gln Ala Gln Lys Leu Tyr Asp

Asp Ser Val Gln Ala Lys Met Thr His Ala Asp Tyr Cys Met Thr Gln 25

Ser Gln Leu Glu Tyr Ile Gly Arg Thr Met Trp Gly Phe Thr Pro Asp

Lys Gln Ala Lys Val Leu Phe Thr Lys Val Gly Lys Arg Val Ser Val 55

Val Ile Ala Ser Arg Glu Ala Phe Ile Lys Glu Ile Gly Lys Pro Val 75

Ile Cys Lys Cys Ser Val Cys Asp Met Tyr Tyr Leu Ala Tyr Arg Lys

Ser Val Asp Ala His Asp Glu Leu Asn Ala Gln Cys Pro Lys Cys Asp

Ser Leu Gly Cys Asp Ser Asp Ile Val His Phe Glu Thr Ser Arg Lys 125 120

Phe Trp Leu Asn Glu Lys Ile Val Lys Ile Leu Thr Pro Asn Lys Asp Pro Glu Arg Val Glu Ala Met Tyr Asp Ser Ala Pro Glu Asp Phe Pro

<210> 5634

<211> 229

<212> PRT <213> B.fragilis

<400> 5634

His Ser Leu Asn Ser Phe Asn His Gln Cys Leu Ile Leu Lys Arg Gln
1 5 10 15

Asn Met Lys Thr Pro Ser Leu Ile Leu Met Thr Ile Ile Leu Cys Asn 20 25 30

Leu Ser Ile Pro Ile Asn Ala Gln Ile Leu Thr Ser Arg Gln Gln Lys 35 40 45

Glu Asp Phe Asp Thr Leu Tyr Ser Leu Leu His Gln Val His Pro Asp
50 55 60

Leu Phe Val Tyr Gln Thr Gln Lys Glu Phe Glu Lys Lys His Asp Ser 65 70 75 80

Ile Tyr Ser Ser Leu Asn Lys Glu Arg Asn Leu Ser Asp Phe Tyr Phe 85 90 95

Ile Val Ser Pro Phe Val Ala Ser Val Lys Asp Gly His Thr Asn Phe
100 105 110

Thr Ile Pro Ala Thr Gln Asp Arg Ile Thr Tyr Leu Asn Asn Gly Gly 115 120 125 Leu Thr Leu Pro Leu Arg Leu Lys Ile Val Glu Asn Lys Ile Leu Val

130 135 140
Asp Phe Pro Leu Ile Ser Cys Ser Ile Gln Glu Asn Asp Glu Ile Ile

145 150 155 160

Cys Met Asn Asn Ile Asn Ser Gln Thr Ile Leu Ser Gln Leu Tyr Leu

165 170 175

Leu Leu Gly Ala Glu Lys Gly Asn Ala Ile Lys Glu Asn Gln Leu Thr

Ser Tyr Leu Ser Thr Leu Leu Trp Tyr Lys Tyr Asn Trp Gly Glu Asn 195 200 205

Met Ile Leu Gln Leu Lys Glu Glu Lys Arg Tyr Gly Lys Asn His Trp
210 215 220

Met Val Ser Ala Lys 225

<210> 5635

<211> 158

<212> PRT

<213> B.fragilis

<400> 5635

His Ile Val Asn Gln Gln Asn Met Asn Thr Asn Asn Ile Gly Gly Val  $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ 

Ile Gln Ala Asp Phe Leu Phe Thr Asp Glu Ile Ser Leu Phe Ser Val 20 25 30

Ile Asn His Ser Ala Val Ile Ser Leu His Arg Pro Asn Thr Trp Arg 35 40 45

Asn Leu Pro Ile Thr Tyr Met Gly Val Ser Pro Asp Val Glu Ala Asp 50 55 60

Asp Thr Gln Ala Gly Thr Leu Tyr Lys Gln Thr Leu Thr Ile Arg Leu 75 Lys Arg Thr Gly Leu Thr Asp Ser Glu Leu His Ile Leu Arg Thr Ile 90 Asn Val Arg Gly Cys Val Val Arg Cys Lys Asp Ala Asn Gly Asn Ile 105 Arg Leu Tyr Gly Ser Lys Glu Tyr Pro Leu Leu Gly Thr Val Ile Glu 120 Lys Thr Gly Thr Lys Ala Ser Asp Leu Ser Gly Ile Glu Ala Thr Phe 135 Ser Gly Lys Gly Ala Tyr Pro Pro Leu Pro Val Thr Glu Leu <210> 5636 <211> 80 <212> PRT <213> B.fragilis <400> 5636 Lys Gly Ser Lys Met Gly Thr Gly Phe Thr Glu Tyr Glu Glu Ser Leu Ile Gln Ala Ile Cys Ser Leu Tyr Tyr Ile Gln Thr Arg Thr Tyr Lys 25 Gln Gly Val Phe Ile Gly Met Ile Pro Lys Asn Thr Arg Ile Thr Leu 40 Asn Gly Ile Tyr Met Met Lys Leu Leu Asn Thr Gly Asn Ala Val Tyr 55 Ile Glu Val Lys Gly Gly Ile Asn Val Leu Thr Ile Ile His Gln Gln <210> 5637 <211> 202 <212> PRT <213> B.fragilis <400> 5637 Ile Met Pro Lys Lys Asp Thr Thr Tyr Asp Arg Ile Glu Arg Ser Leu 10 Phe Lys Asp Arg Gly Glu Ser Ala Leu Gln Leu Ser Pro Lys Glu Met 2.5 Glu Ile Lys Asn Arg Met Met Leu Cys Val Ser Lys Lys Met Glu Ser 40 Pro Leu Ile Glu Asp Gln Glu Leu Val Thr Phe Leu Met His Gly Cys Gly Gly Gln Ala Glu Pro Val Ser Gln Ser Gln Ala Tyr Arg Asp Ile 70 Gly Met Ile Asn Arg Leu Val Gly Asn Ile Gln Leu Ala Ala Lys Ser 90 Trp Tyr Arg Tyr Met Ile Val Glu Gly Gly Lys Lys Ala Phe Gln Leu 100 Ala Ile Asp Asn Gly Asp Ala Lys Gly Ala Ala Ala Ala Leu Asp Lys 120 Ile Gly Lys Tyr Thr Arg Ser Asp Lys Asp Asp Asp Ala Phe Asp Phe 135

Ser Gln Leu Ile Pro Pro Ser Phe Glu Pro Ser Asp Asp Val Thr Thr

Leu Glu Gly Ile Glu Val Ile Asp Asn Leu Glu Gln Arg Arg Gln Glu

Leu Arg Ser Leu Cys Lys Asp Met Leu Thr Lys Gln Ala Thr Asp Ile

150

155

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180
Gln Thr Ile Glu Glu Glu Asp Ile Glu Glu
                            200
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Arg Thr Ala Lys Met Glu Asn Ile Phe Asp Ser Ala Lys Thr Ile Gln
                                    10
Glu Lys Arg Thr Ile Leu Lys Gly Leu Ser Lys Pro Leu Gln Ile Leu
                                25
Val Lys Glu Ala Ala Ile Pro Thr Val Asn Asp Gly Leu Lys Ala Ile
                            40
                                                 45
Tyr Ala Gln Ser Gly His Thr Glu Leu Lys Thr Leu Lys Gln Trp Asn
                        55
Lys Glu Gly Arg Ser Ile Lys Lys Gly Ser His Ala Leu Cys Leu Trp
                                        75
Gly Ala Pro Lys Lys Val Glu Thr Thr Gln Val Glu Glu Ala Gln Gly
                                    90
Glu Asp Asn Asp Pro Met Asn Phe Tyr Pro Ile Cys Phe Val Phe Ser
                               105
           100
Asn Leu Gln Val Tyr Glu Lys Gln
        115
<210> 5639
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<213> B.fragilis
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Ile Ala Gln Asn Cys Ile Leu Tyr Ala Gln Cys Ile Asn Arg Thr Lys
Thr Tyr His Val Ser Tyr Gly Tyr Lys Pro Ile Ile Asn Thr Leu
                                25
Cys Asp Lys Thr Ala Gln Phe Thr Gln Leu His Lys Lys Gly Val Pro
                            40
Phe Leu Gln Gly Gly Leu Val Cys Ser Gly Lys Ser Cys Leu Cys Pro
<210> 5640
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Thr Ile Lys Asn Thr Ile Thr Met Lys Lys Ile Ile Leu Leu Leu Ala
Leu Cys Phe Thr Ala Asn Asn Phe Phe Ala Gln Thr Thr Asp Pro Asn
Gln Leu Lys Asn Glu Gly Asn Asp Ala Leu Asn Ala Lys Asn Tyr Ala
Val Ala Phe Glu Lys Tyr Ser Glu Tyr Leu Lys Leu Thr Asn Asn Gln
                        55
Asp Ser Val Thr Ala Tyr Asn Cys Gly Val Cys Ala Asp Asn Ile Lys
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Lys Tyr Lys Glu Ala Ala Asp Tyr Phe Asp Ile Ala Ile Lys Lys Asn

90 85 Tyr Asn Leu Ala Asn Ala Tyr Ile Gly Lys Ser Ala Ala Tyr Arg Asp 105 Met Lys Asn Asn Gln Glu Tyr Ile Ala Thr Leu Thr Glu Gly Ile Lys 120 Ala Val Pro Gly Asn Ala Thr Ile Glu Lys Leu Tyr Ala Ile Tyr Tyr 135 Leu Lys Glu Gly Gln Lys Phe Gln Gln Ala Gly Asn Ile Glu Lys Ala 155 150 Glu Glu Asn Tyr Lys His Ala Thr Asp Val Thr Ser Lys Lys Trp Lys 170 Thr Asp Ala Leu Tyr Ser Leu Gly Val Leu Phe Tyr Asn Asn Gly Ala 185 Asp Val Leu Arg Lys Ala Thr Pro Leu Ala Ser Ser Asn Lys Glu Lys 200 Tyr Ala Ser Glu Lys Ala Lys Ala Asp Ala Ala Phe Lys Lys Ala Val 215 220 Asp Tyr Leu Gly Glu Ala Val Thr Leu Ser Pro Asn Arg Thr Glu Ile 235 230 Lys Gln Met Gln Asp Gln Val Lys Ala Met Ile Lys 245

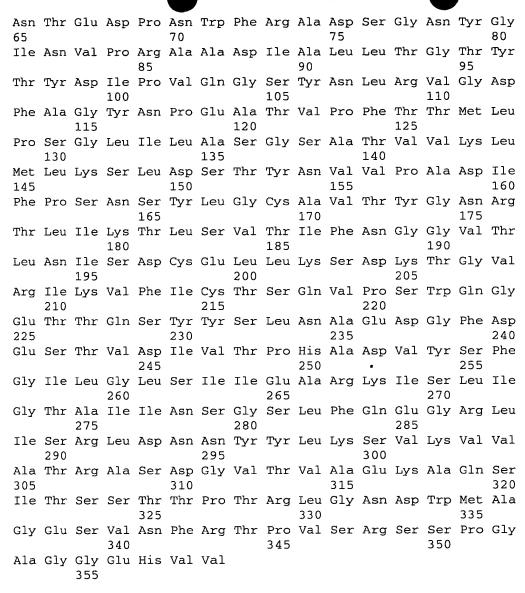
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Asn Asn Glu

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Asn Arg Leu Lys Asn Ile Leu Ser Ile Ala Gln Phe His Gln Ile Cys
1 5 10 15

Ala Met Ile Leu Gln Lys Tyr Ile Thr Leu His Pro Gln Ile Lys Leu
20 25 30

Lys Asn Lys Asn Met Lys Ala Phe Val Phe Pro Gly Gln Gly Ala Gln 35 40 45

Phe Val Gly Met Gly Lys Asp Leu Tyr Glu Thr Ser Ala Leu Ala Lys 50 55 60

Glu Leu Phe Glu Lys Ala Asn Asp Ile Leu Gly Tyr Arg Ile Thr Asp
65 70 75 80

Ile Met Phe Asn Gly Thr Asp Glu Asp Leu Arg Gln Thr Lys Val Thr 85 90 95

Gln Pro Ala Val Phe Leu His Ser Val Ile Ser Ala Leu Cys Met Gly
100 105 110

Asp Asp Phe Lys Pro Glu Met Thr Ala Gly His Ser Leu Gly Glu Phe 115 120 125

Ser Ala Leu Val Ala Ala Gly Ala Leu Ser Phe Glu Asp Gly Leu Lys 130 135 140

Leu Val Tyr Ala Arg Ala Met Ala Met Gln Lys Ala Cys Glu Ala Thr 145 150 155 160

Pro Ser Thr Met Ala Ala Ile Ile Ala Leu Pro Asp Glu Lys Val Glu 165 170 175

Glu Ile Cys Ala Ser Val Thr Ala Glu Gly Glu Val Cys Val Pro Ala 180 185 190

Asn Tyr Asn Cys Pro Gly Gln Ile Val Ile Ser Gly Ser Val Pro Gly
195 200 205

Ile Glu Lys Ala Cys Glu Leu Met Lys Ala Ala Gly Ala Lys Arg Ala 210 215 220

Leu Pro Leu Lys Val Gly Gly Ala Phe His Ser Pro Leu Met Asp Pro 225 230 235 240

Ala Lys Val Glu Leu Glu Ala Ala Ile Asn Ala Thr Glu Phe His Thr

245

250

255

Pro Lys Cys Pro Val Tyr Gln Asn Val Asp Ala Leu Pro His Thr Asp 260 265 270

Pro Gln Glu Ile Lys Lys Asn Leu Val Ala Gln Leu Thr Ala Ser Val 275 280 285

Arg Trp Thr Gln Thr Val Lys Asn Met Val Ala Asp Gly Ala Thr Asp 290 295 300

Phe Thr Glu Cys Gly Pro Gly Ala Val Leu Gln Gly Leu Ile Lys Lys 305 310 315 320

Ile Asp Ser Thr Val Ser Ala His Gly Ile Ala 325 330

<210> 5645

<211> 157

<212> PRT

<213> B.fragilis

<400> 5645

Cys Ile Met Lys Asn Leu Glu Ile Leu Pro Leu Ser Ala Glu Ser Lys

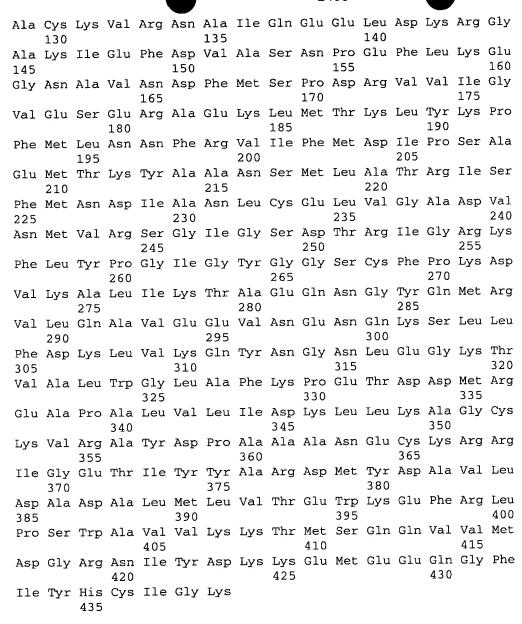
1 5 10 15

Lys Arg Ile Glu Glu Phe Ala Arg Gln Tyr Gln Arg Tyr Ala His Ile
20 25 30

Ala Ile Glu Ile Val Ser Tyr Ser Glu Gly Arg Leu Ile Val Arg Ala

40 Glu Gln Lys Asp Leu Val Asn Asp Lys Phe Leu Ser Lys Lys Glu Leu Thr Glu Arg Val Arg Asp Met Phe Lys Asp Glu Ile Pro Glu Asp Trp Lys Leu Thr Val Ser Ala Val Asn Phe Asp Arg Lys Asp Ile Asp Gly 90 Ile Thr Leu Asp Trp Ile Lys Lys Arg Met Glu Arg Leu Gly Leu Lys Asn Lys His Leu Ser Asn Tyr Thr Gly Ile Asp Lys Cys Thr Val Ser 120 Ser Ile Leu Ser Gly Asp Lys Glu Leu Thr Lys Trp His Lys Val Ala 135 Leu Tyr Tyr Phe Phe Lys Tyr Tyr Glu Val Ala Asn Phe 150 <210> 5646 <211> 111 <212> PRT <213> B.fragilis <400> 5646 His Thr Met Asn Leu Ser Ser Phe Lys Leu Thr Asn Ile Asn Glu Leu 10 Ile Ser Val Tyr Lys Glu Asn Pro Glu Arg Phe Asn Arg Phe Tyr Asn Ala Val Tyr Leu Leu Leu Asp Gly Ile Pro Glu Cys Gly Ser Ile Arg 40 Val Met Asp His Cys Glu Ala Ser Ser Tyr Asp Leu Phe Ile Lys Cys 55 Ala Cys Trp Ile Ile Gln Glu Glu Thr Glu Gln Lys Glu Leu Thr Asp 70 75 Ala Leu Leu Glu Phe Ser Asp Asp Tyr Thr Ile Ile Arg Arg Cys Ala 90 85 Lys Phe Val Lys Ser Lys Ser Trp Val His Phe Tyr Ser Arg Arg 105 <210> 5647 <211> 439 <212> PRT <213> B.fragilis <400> 5647 Lys Asn Met Lys Ile Ala Ile Val Gly Thr Gly Tyr Val Gly Leu Val 10 Thr Gly Thr Cys Phe Ala Glu Ile Gly Val Asp Val Thr Cys Val Asp 2.5 Thr Asn Ser Glu Lys Ile Glu Ala Leu Lys Lys Gly Ile Ile Pro Ile 40 Tyr Glu Asn Gly Leu Glu Glu Met Val Ile Arg Asn Thr Lys Ala Gly 55 Arg Leu Lys Phe Thr Thr Ser Leu Glu Ser Cys Leu Asp Asp Val Glu Val Val Phe Ser Ala Val Gly Thr Pro Pro Asp Glu Asp Gly Ser Ala 85 Asp Leu Ser Tyr Val Leu Ala Val Ala Arg Thr Ile Gly Gln Asn Met

105 Lys Lys Tyr Lys Leu Val Val Thr Lys Ser Thr Val Pro Val Gly Thr 120



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Asn Lys Met Lys Asn Val Ser Ser Ala Lys Ser Ala Glu Ala Lys Ala 1 5 10 15

Val Val Leu Ser Asn Val Ala Asn Lys Lys Asn Glu Thr Ala Pro Leu 20 25 30

Ile Val Leu Pro Ser Leu Pro Thr Glu Lys Glu Glu Thr Lys Glu Gln

Val Ser Ala Lys Val Glu Thr Pro Val Gln Thr Ser Lys Lys Glu Ser 50 55 60

Ser Ser Val Val Ala Ala Pro Asn Lys Arg Leu Ser Ile Asp Glu Leu 65 70 75 80

Thr Asp Lys Ala Glu Arg Val Tyr Leu Leu Arg Gln Lys Tyr Gln Glu 85 90 95

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2407
Val Arg Glu Lys Arg Lys Gln Leu Glu Ser Phe Thr Ile Ser His Asp
                                105
Lys Asn Asn Ala Gln Leu Thr Leu Val Asp Ala Lys Gly Leu Ser Ile
                            120
       115
Ser Thr Ser Asn Pro Val Ala Ile Gly Lys Leu Leu Ser Asp Trp Met
                                            140
                       135
Leu Asp Leu Asn Asn His Leu Ala Lys Thr Glu Glu Glu Ile Arg Ser
                                       155
                   150
Glu Leu Glu Arg Leu Asn
                165
<210> 5649
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Lys Glu Met Asn Ser Asp Gly Asn Lys Ile Leu Asp Ala Ile Lys Arg
Met Ala Ala Asp Asp Asn Lys Gly Leu Arg Met Thr Thr Thr Ile Val
Asp Val Lys Asp Asp Pro Leu Gly Ser Ile Val Gly Phe Gly Thr Glu
                            40
Lys Val Cys Gly Asp Asp Ala Phe Ala Gln Thr Met Gly Leu Pro Gly
                                            60
                        55
Lys Tyr Met Ala Cys Ala Phe Phe Ile Asp Arg Glu Glu Leu Lys Lys
                    70
Tyr Leu
<210> 5650
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Leu Lys Pro Asn Tyr Met Arg His Val Lys Trp Ile Phe Val Val Leu
Leu Ile Ser Ser Leu Thr Ser Phe Val Glu Lys Asp Lys Pro Thr Gly
                                25
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Gly Leu Asn Val Gly Asp Val Ala Pro Asp Phe Thr Ile Glu Ser Thr 35 40 45

Ser Asp Ala Gln Tyr Asn Phe Asp Leu Thr Asp Leu Lys Gly Lys Tyr 50 55 60

Val Leu Leu Ser Phe Trp Ala Ser Tyr Asp Ala Gln Ser Arg Met Gln 65 70 75 80
Asn Ala Ser Leu Ser Asn Ala Leu Arg Ser Thr Ser Gln Asp Val Glu

Met Val Ser Val Ser Phe Asp Glu Tyr Gln Ser Val Phe Gln Glu Thr
100 105 110

Ile Arg Lys Asp Gln Ile Val Thr Pro Thr Cys Phe Ala Glu Thr Lys

Gly Glu Ser Ser Gly Leu Phe Lys Lys Tyr Arg Leu Asn Arg Gly Phe
130 135 140

Thr Asn Tyr Leu Leu Asp Gly Asn Gly Val Ile Ile Ala Lys Asn Ile
145 150 155 160

Ser Ala Ala Glu Leu Ser Ala Tyr Ala Asn Lys Ile Lys Gly

165

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Trp Ile Ile Glu Pro Lys Ile Phe Phe Asp Pro Arg Gly Tyr Phe Met
                                25
Glu Ala Phe Lys Gln Gln Glu Phe Asp Ala Thr Ile Gly Gln Ile Asn
                            40
Phe Ile Gln Asp Asn Glu Ser Gln Ser Ser Phe Gly Thr Leu Arg Gly
                        55
Leu His Tyr Gln Lys Gly Ala Tyr Ser Gln Ala Lys Leu Val Arg Val
                   70
                                        75
Ile Lys Gly Glu Val Leu Asp Val Ala Val Asp Leu Arg Lys Ser Ser
Pro Thr Phe Gly Lys His Ile Ser Val Leu Leu Ser Asp Glu Asn Lys
                                105
            100
Arg Gln Leu Phe Ile Pro Arg Gly Phe Ala His Gly Phe Leu Val Lys
                            120
Ser Glu Ile Ala Ile Phe Thr Tyr Lys Val Asp Asn Ile Tyr Ala Pro
                                            140
                       135
Gln Ser Glu Ala Ser Ile Leu Tyr Asn Asp Pro Ala Leu Ala Ile Asp
                                       155
                    150
Trp Pro Ile Ala Asp Ser Gln Leu Val Met Ser Glu Lys Asp Lys Gln
                                    170
               165
Ala Gly Ala Phe Arg Glu Ala Glu Tyr Phe Glu
           180
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Gly Asp Lys Asn Met Glu Ser Lys Phe His Glu Leu Lys Asn Arg Leu
                                    10
Leu Lys Asn Ile Asp Gln Thr Ser Glu Ser Arg Leu Tyr Met Asp Ile
                                25
Gln Leu Ala Gln Asn Cys Glu Thr Leu Met Ser Ile Ile Lys Lys Asp
                            40
Ile Gly Tyr Leu Ala Lys Glu Gly Ile Leu Ser Pro Gly Ile Ala Glu
                                             60
Asp Phe Lys Asp Val Phe Leu Ser Ala Gly Ile Lys Cys Asn Ser Gly
                                         75
                    70
Gly Ser Ser Gly Tyr Met Leu Ile Trp Asp Gly Thr Ala Val Asp Ile
                                    90
                85
Ser Gly Thr Ala Thr Ala Val Ile Trp Lys Ser Glu Arg Ala Phe Ile
                                105
Lys Gly Arg Ala Cys Ala Phe Leu Leu Gly Glu Val Ser Ala Ile Thr
                                                 125
                             120
Cys Glu Arg Ser Met Val Ile Ala Ala Gly Ser Ser Thr Ile Leu Ala
                        135
Glu Gly Asp Ser Val Val Gly Val Ser Gly Tyr His Ala Ser Val Lys
                                        155
                   150
Ala Ser Asp Tyr Ala Thr Val Val Asn Met Asn Cys Pro Asn Ile Asp
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                165
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<210> 5653 <211> 74 <212> PRT

<213> B.fragilis

<400> 5653

Pro Lys Lys Lys Glu Gly Lys Pro Met Phe Lys Asp Ile Ile Glu Leu 1 5 10 15 Asp Lys Gln Val Val Asp Arg Ile Val Asp Lys Val His Glu Asn Asn

20 25 30

Leu Glu Ile Glu Met Glu Met Gly Val Val Lys Asp Gly Met Val Lys

35 40 45
Val Leu Phe Leu Tyr Lys Asp Pro Glu Leu Leu Gln Ser Val Ile Asn
50 55 60

Glu Ser Val Thr Glu Glu Tyr Asp Leu Pro

<210> 5654

<211> 228

<212> PRT

<213> B.fragilis

<400> 5654

Leu Lys Asp Leu Thr Ala Asn Asn Asn Arg Glu Trp Phe Asn Glu His 20 25 30

Arg Glu Glu Tyr Glu Ile Ala Arg Leu Glu Phe Glu Asn Phe Leu Ser 35 40 45

Thr Val Ile Ala Arg Ile Ser Leu Phe Asp Glu Ser Ile Arg Gly Ile 50 55 60

Gln Pro Lys Glu Cys Thr Tyr Arg Ile Tyr Arg Asp Thr Arg Phe Ser 65 70 75 80

Ser Asp Lys Thr Pro Tyr Lys Asn His Phe Gly Gly Tyr Ile Asn Ala 85 90 95

Lys Gly Lys Lys Ser Tyr His Ser Gly Tyr Tyr Ile His Ile Gln Pro 100 105 110

Glu Gly Cys Met Leu Ala Gly Gly Ser Leu Cys Leu Pro Ser Asn Ile 115 120 125

Leu Lys Ala Leu Arg Gln Ser Ile Tyr Asp Asn Ile Asp Glu Tyr Arg 130 135 140

Ser Ile Val Glu Asp Pro Glu Phe Gln Gln Phe Phe Pro Ile Val Gly 145 150 155 160

Glu Asp Phe Leu Lys Thr Ala Pro Lys Gly Phe Pro Lys Asp Phe Lys 165 170 175

Tyr Ile Asp Tyr Leu Lys Pro Lys Glu Phe Thr Cys Ala Tyr Ser Val 180 185 190

Pro Asp Ser Phe Phe Leu Thr Pro Asp Ile Leu Asp Lys Ile Glu Glu
195 200 205

Val Phe Arg Gln Phe Lys Arg Phe Ala Asp Phe Thr Asn Phe Thr Ile 210 215 220

Asp Asp Phe Glu

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לוויאו מודים להיידו במורח און האיני מיינים להיידו להיידו מיינים להיידו להיידו מיינים להיידו היינים להיידו הייני
מיינו מיינים מודים היינים און היינים מודים מיינים להיידו מיינים להיידו מיינים להיידו מיינים להיידו מיינים להיי
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Arg Glu Ala Glu Pro Arg Phe Ala Leu His Gly Thr Leu Gly Ser Tyr 250 245 Val Lys Tyr Gly Val Asp Lys Gln Glu Ala Ala Leu Leu Ala Gly Glu 265 Ile Pro Glu Arg Pro Asn Trp Gly Glu Glu Ser Glu Gln Glu Trp Gly 280 Leu Leu His Thr Glu Ile Asn Gly Lys Glu Ile Cys Arg Lys Tyr Pro 300 295 Gly Ile Ala Gly Asn Tyr Gly Gly Phe Tyr Gln Asn Ile Tyr Glu His 315 310 Leu Cys Leu Gly Gln Pro Leu Glu Thr His Ala Gln Asp Ile Leu Asn 330 325 Val Ile Arg Ile Ile Glu Ala Ala Tyr Gln Ser His Arg Asp Asn Lys 345 340 Ile Val Asn Leu Lys 355

<210> 5657 <211> 181 <212> PRT <213> B.fragilis

<400> 5657

Ile Ile Asn Leu Asn Met Thr Ala Lys Phe Ile Ile Met Val Leu Val 10 Leu Ala Tyr Ile Met Val Ile Ile Ala Ile Ser Ile Tyr Leu Ile Lys 2.5 Ile Ile Cys Thr Arg Tyr Asn Gln Asn Ser Asp Gln Ile Leu Pro Pro 40 Pro Asn Met His Ser Ile Gln Glu Ser Ala Ser Met His Leu Val Arg 55 Ile Gly Gln Leu Pro His Pro Gly Pro Gly Tyr Cys Tyr Tyr Glu Leu 70 75 Gly Gly Met Arg Tyr Gln Ala Leu Thr Gly Phe Asp Ile Gly Val His 85 Glu Gly Tyr Ala Lys Ala Glu Leu Asn Asn Arg Tyr Asp Lys Tyr Ala 105 Val Gly Val Tyr Arg Glu Gly Asp His Lys Leu Met Gly Tyr Val Arg 120 Arg Glu Gln Asn Arg Glu Leu Tyr Glu Phe Met Leu Asn Asn Asn Cys 140 135 Ile Ala Lys Ala Lys Phe Arg Ile Trp Ile His Gln Gly Glu Ile Tyr 155 150 Gly Ala Ala Tyr Ile Lys Glu Glu Trp Lys Ser Ser Leu Gly Phe Lys 165 170 Ser Asp Ile Lys Ile

<210> 5658 <211> 174 <212> PRT <213> B.fragilis

180

<400> 5658

Lys Leu Ile Glu Met Leu Asn Glu Lys Arg Thr Gln Arg Ile Met Lys 5 10 Ser Lys Phe Leu Ile Phe Leu Ser Ala Val Ala Met Leu Leu Leu Phe 25 Ser Asn Cys Gly Ser Lys Thr Thr Ser Asn Asp Gln Ala Thr Thr Glu

40 Val Lys Asp Thr Val Thr Ser Lys Glu Glu Ala Val Pro Asp Ser Val Ser Ile Leu Gly Asp Gln Val Tyr Asp Ile Val Asn Thr Ala Pro Glu 75 Phe Pro Gly Gly Met Lys Ala Cys Leu Glu Phe Leu Tyr Lys Asn Ile 90 Thr Tyr Pro Ala Gln Ala Ile Glu Ser Lys Gln Glu Gly Gln Val Val 105 Ile Gln Phe Val Val Thr Lys Asn Gly Lys Ile Ile Asp Pro Lys Val 120 Val Lys Ser Val Ser Pro Ser Leu Asp Ala Glu Ala Ile Arg Ile Ile 140 135 Asn Leu Met Pro Asp Trp Thr Pro Gly Lys Gln Lys Asn Gly Gln Glu 155 150 Val Asn Ser Arg Phe Thr Leu Pro Val Arg Phe Thr Leu Lys 165

<210> 5659 <211> 145 <212> PRT <213> B.fragilis

<400> 5659

Thr Met Tyr Asp Ile Val Ala Gln Arg Leu Arg Leu Phe Leu Ala Lys 10 Lys Asp Ile Thr Cys Lys Lys Leu Ser Ala Met Ile Phe Met Ser Glu Ala Thr Leu Lys Gly Lys Leu Asn Gly Thr Arg Thr Leu Asp Leu Asn 40 Thr Ile Ile Ser Ile Ala Ile Arg Leu Glu Asp Leu Ser Val Glu Trp 55 60 Leu Leu Arg Gly Glu Gly Asp Met Phe Lys Ser Ser Ser Gly Val Ser 70 Ile Leu Ser Ser Ser Val Pro Ile Phe Thr Gly Glu Thr Ser Phe Ile 90 Tyr Ser Met Tyr Lys Glu Glu Arg Glu Glu Val Lys Thr Leu Leu Lys 105 100 Gln Asn Gly Ile Leu Glu Glu Arg Ile Arg Gln Leu Glu Asp Asn 125 120 Arg Leu Leu Arg Asp Gln Val Val Thr Glu Leu Asn Leu Asn Thr Lys 135

Leu 145

<210> 5660 <211> 122 <212> PRT <213> B.fragilis

<400> 5660

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2413
Leu Leu Arg Gly Lys Gly Arg Val Cys Asn Ser Ser Ser Ser Ile Ser
                                        75
Ser Asp Val Leu Val Glu Glu Leu Lys Met Glu Asn Asn Leu Leu Lys
                                    90
                85
Arg Lys Ile Gln Val Leu Gln Glu Leu Leu Glu Phe Lys Met Glu Lys
                                105
Ile Arg Ala Glu Asn Gly Asn Ile Lys Lys
<210> 5661
<211> 303
<212> PRT
<213> B.fragilis
<400> 5661
Gln Lys Ser Asp His Tyr Val Ser Ser Leu Leu Tyr Ser Val Phe Ile
                                    10
Tyr His Met Val Arg Lys Ser Ser Ile Asn Lys Tyr Glu Leu Asp Val
Arg Lys Gly Leu Gln Glu Leu Phe Asp Lys Cys Arg His Asn Met Lys
                            40
His Ser Gly Asp Leu Leu Cys Gln Gln Asn Gly Phe Ile Asp Tyr
                        55
Lys Gly Arg Pro Cys Val Gly Leu Gly Asp Glu Gly Leu Asn Cys Met
                    70
Gln Gln Val Asn Phe Ile Ser Phe Asn Gly Ile Gly Asn Ile Thr Asp
                                    90
Asp Asn Asp Tyr Tyr Lys Lys Glu Gly Asn Asn Phe Phe Tyr Gly Asn
                                                    110
                                105
            100
Ser Glu Phe Glu Ala Asp Ile Met Arg Gln His Ile Thr Tyr Met Asn
                                               125
                            120
Ile Trp Glu Asn Ser Tyr Phe Leu Arg Val Phe Thr Gln Val Val Asn
                                            140
                        135
Val Leu Asn Gly Leu Asn Tyr Asn Trp Asn Leu Thr Phe Lys Asn Leu
                                        155
Lys Pro Asn Gln Lys Ser Glu Gln Ile Arg Glu Gly Ile Ile Lys Leu
                                     170
                165
Leu Asp Leu Ser Pro Asn Phe Gln Arg Ile Leu Lys Asp Ala Tyr Val
                                185
Gly Gln Ile Arg Asn Ala Val Ala His Thr Gln Tyr His Cys Ile Gln
                                                205
                            200
Gly Gly Ile Leu Tyr Asp Asn Tyr Ser Pro Ser Ser Lys Tyr Ser Ile
                                            220
                        215
Leu Gln Gly Leu Ser Tyr Glu Glu Trp Glu Lys Lys Tyr Val Tyr Ser
                                         235
                    230
Phe Phe Ile Phe Ile Gly Ile Phe Gln Met Leu Lys Gln Ile Thr Asn
                                     250
                245
Glu Phe Tyr Leu Pro Cys Ser Gln Leu Thr Phe Ala Lys Gly Val Pro
                                                    270
                                 265
             260
 Ile Gln Ile Pro Leu Ser Asp Asn Lys Gly Tyr Ala Glu Thr Tyr Leu
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280 Tyr Pro Asn Gln Lys Gly Asp Ile Trp Arg Phe Thr Arg Ile Ile

295

300

<210> 5662

<211> 70

<212> PRT

<213> B.fragilis

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Ala Tyr Arg Leu Asn Glu Lys Gln Leu Ser Met Tyr Ile His His Leu
                                    10
Met Val Lys Asp His Lys Arg Lys Tyr Tyr Tyr Leu Ser Tyr Glu Lys
                                25
Arg Phe Ile Phe Ile Ile Asn Leu Val Ser Ala Lys Leu Gln Asn Ser
                            40
Asn Gly Leu Lys Lys Lys Gln Ser Asn Ser Ser Ala Leu Ile Cys
                       55
Phe Tyr Arg Asn Met Ala
<210> 5663
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Arg Trp Arg Glu Thr Ser Val Asn Asn Phe Ser Ser Leu Gln Ser Cys
Phe Ile Asn Val Asn Glu Ile Lys Val Arg Phe Gly Gly Ala Pro Gly
                                25
Leu Val Met Thr Lys Ser Trp Arg Asp Gly Tyr Arg Pro Cys Glu Asp
                           40
Ala Met Ser Leu Lys Glu Ser Leu Ala Ser Ile Gly Met Thr Thr Val
                        55
Lys Val Pro Phe Gly Glu Ser Lys Phe Asp Thr Pro Phe Ser Asn Ser
Ser
<210> 5664
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<212> PRT
<213> B.fragilis
<400> 5664
Ser Lys Leu Phe Ala Arg Leu Leu Thr Leu Ile His Leu Lys Val Gly
                                    10
Ser Ser Thr Pro Phe Ser Leu Leu Leu Lys Gly Val Lys Leu Pro Thr
Met Val Cys Tyr Ala Ser Gly Leu Pro Asp Ser Gln Glu Val His Val
                            40
Ser Gln Lys Asp Val Tyr Ala Ala Phe Gly Arg Tyr Leu Leu Arg Phe
                                             60
                        55
Ala Phe Asn Val Glu
<210> 5665
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<212> PRT
<213> B.fragilis
<400> 5665
Tyr Lys Met Glu Leu Glu Thr Ile Gly Glu Asn Ala Gly Lys Val Trp
                                    10
Arg Thr Leu Asn Glu Met Arg Gly Glu Ile Ser Ile Gln Glu Leu Ser
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25 Arg Lys Ile Asn Leu Ser Ala Glu Asp Val Ala Leu Ala Val Gly Trp 2415

35

Leu Ala Arg Glu Asn Asn Ile Phe Ile Gln Arg His Asn Tyr Leu Leu 50

Tyr Val Ser His Asp Ala Phe 65

70

<210> 5666 <211> 268 <212> PRT

<213> B.fragilis

<400> 5666

Met Lys Met Glu Asn Ser Val Leu Thr Gly Lys Pro Tyr Asn Ile Gly 1 5 10 15

Tyr Ala Leu Ser Gly Gly Phe Ile Lys Gly Phe Ala His Leu Gly Val 20 25 30

Ile Gln Ala Leu Leu Glu His Asp Ile Lys Pro Asp Ile Ile Ser Gly

35 40 45
Val Ser Ala Gly Ala Leu Ala Gly Val Phe Tyr Ala Asp Gly Asn Glu

Pro Tyr Arg Val Leu Asp Tyr Phe Ser Gly His Lys Phe Gln Asp Leu

70

75

80

Thr Lys Leu Val Ile Pro Lys Val Gly Leu Phe Ala Leu Gly Glu Phe
85 90 95

Ile Asp Phe Leu Lys Ser Asn Leu Lys Ala Gln Lys Leu Glu Asp Leu 100 105 110

Lys Leu Pro Leu Ile Ile Thr Ala Thr Asp Leu Asp His Gly Arg Ser 115 120 125 Met His Phe His Lys Gly Asn Ile Ala Glu Arg Val Ala Ala Ser Cys

130 135 140
Cys Met Pro Val Leu Phe Thr Pro Val Lys Ile Gly Asn Thr His Tyr

145 150 155 160

Val Asp Gly Gly Leu Leu Met Asn Leu Pro Val Ser Thr Ile Arg Asn

165 170 175

Glu Cys Glu Lys Val Val Ala Val Asn Val Ser Pro Leu Met Ala Glu 180 185 190

Lys Tyr Lys Met Asn Ile Val Ser Ile Ala Met Arg Ser Tyr His Phe 195 200 205

Met Phe Arg Ala Asn Thr Phe Pro Glu Arg Asp Asn Cys Asp Leu Leu 210 215 220

Ile Glu Pro Tyr Asn Leu Glu Gly Tyr Ser Asn Thr Glu Leu Glu Lys 225 230 235 240

Ala Glu Glu Ile Phe Glu Gln Gly Tyr Asn Thr Ala Ser Glu Val Leu 245 250 255

Asp Gln Leu Ile Glu Glu Lys Gly Lys Ile Trp Lys 260 265

<210> 5667

<211> 406

<212> PRT

<213> B.fragilis

<400> 5667



Cys	His 50	Thr	Ala	Asp	Gly	Ala 55	Val	Ala	Ala	Tyr	His 60	Arg	Met	Gly	Val
65	Arg				70					75		Gly			80
Ala				85					90			Val		95	
			100					105				Pro	110		
		115					120		•			Tyr 125			
	130					135					140	Ile			
145					150					155		Ser			160
				165					170			Pro		175	
			180					185				Glu	190		
		195					200					Phe 205			
	210					215					220	Thr			
225	Leu				230					235		Asp			240
Tyr	Arg	His	Pro	Asp 245		Gln	Lys	Leu	Ser 250	Glu	Pro	Thr	Glu	Asp 255	Glu
			260	Ile	Ala			265				Tyr	270		
		275					280					Leu 285			
	290					295					300				
305					310					315		Glu			320
Leu				325					330					335	
			340					345					350		Ala
		355	,				360					365			Gly
Thr	Asn 370	Gly	Asn	Met	Gly	Arg		Leu	Leu	Arg	Lys 380	Asn	Asn	Arg	Phe
Gln 385		Ala	Gln	Thr	Met 390		Glu	Ala	Thr	Lys 395	Met	Ala	Ile	Glu	Ser 400
		Lys	s Glu	Ser 405	Ile										
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<210> 5668

<211> 480

<212> PRT

<213> B.fragilis

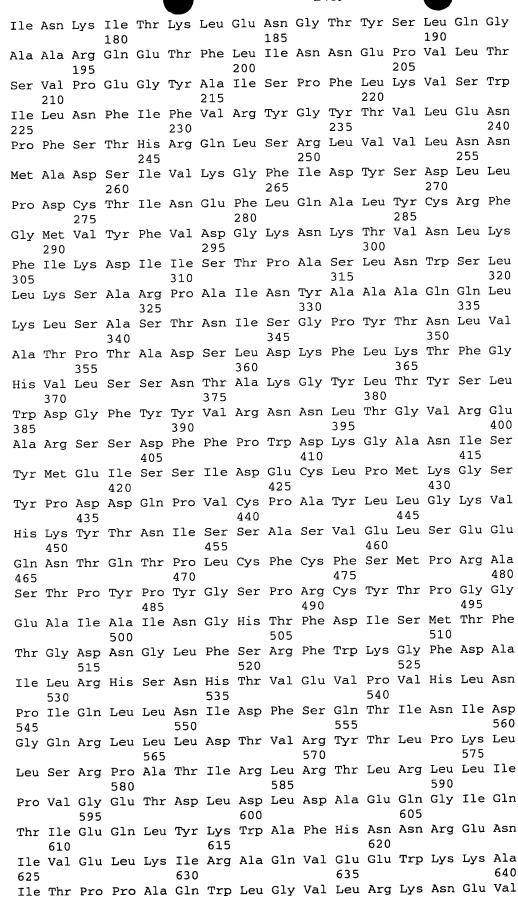
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Ser	Thr 50	Val	Glu	Val	Val	Pro 55	Lys	Gly	Lys	Glu	Ala 60	Pro	Ile	Lys	Phe
Val 65	Pro	Arg	Gly	Arg	Asn 70	Asn	Asn	Met	Met	Tyr 75	Asp	Ile	Met	Lys	Lys 80
Ile	_		Asn	85					90					95	
			Gly 100					105					110		
		115	Lys				120					125			
	130		Asp			135					140				
145			Asn		150					155					160
			Gln	165					170					175	
			Cys 180					185					190		
		195	His				200					205			
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225			Arg		230					235					240
			Asp	245					250					255	
			Tyr 260					265					270		
		275					280					285			
	290		Gln			295					300				
305			Lys		310					315					320
			Arg Glu	325					330					335	
			340 Lys					345					350		
		355					360					365			Val
	370					375					380				Gly
385					390					395					400 Glu
				405					410	1				415	Thr
			420					425					430		Asp
		435	5				440	1				445			Gly
	450	)				455	j				460	ı			Lys
465		VIC	4 1111	ב ענג	470		. <u>-</u>			475		<b>-</b>	-		480

<210> 5669 <211> 214 <212> PRT <213> B.fragilis

<400> 5669 Ser Asn Ile Leu Gly Gly Leu Thr Met Gly Tyr Tyr Lys Arg Leu Ser Thr Tyr Arg Ala Glu Val Lys Arg Tyr Asn Ala Ser Arg Arg Lys Ala 25 Thr Gln Leu Thr Asn Ala Pro Ala Ser Gly Leu Ile Arg Leu Glu Thr 40 Val Ser Glu Thr Glu Arg Phe Ser Met Ala Gln Asp Ala Asp Arg Leu 55 Thr Ala Tyr Asn Lys Ala Val Glu Lys Trp Gln Asp Ser Val Ala Arg 75 Gln Leu Arg Ala Gly Ile Ala Gly Arg Ser Met Arg Ile Ala Arg Glu 90 85 Leu Glu Pro Arg Ala Tyr Thr Asp Lys Tyr Gly Ile Ile Asn Arg Leu 105 Gly Phe Ser Phe Pro Arg His Gly Ile Tyr Ile His Lys Gly Ala Gly 120 Glu Gly Gln Gly Gly Phe Ile Gly Ser Lys Trp Asn Tyr Leu Lys Lys 140 135 Ile Asn Gly Val Glu Ile Asp Thr Gly Ile Val Arg His Thr Asn Leu 155 150 Lys Ser Leu Gly Arg Gln Asn Glu Gly Asn Arg Arg Ala Tyr Glu Trp 170 165 Phe Asp Pro Val Ile Arg Asn Arg Ile Asn Glu Leu Ala Asp Ile Val 185 180 Thr Asp Tyr Phe Asp Thr Met Leu Ile Asp Ala Thr Arg Ile Tyr Ile 200 195 Asp Lys Arg Asn Ser Leu 210 <210> 5670 <211> 733 <212> PRT <213> B.fragilis <400> 5670 His Met Ser Leu Lys Ile Lys Asn Gln Leu Gly Ile Phe Asp Leu Gln 10 Asn Asp Phe Ser Ile Glu Ile Glu Asp Thr Ser Pro Ile Tyr Asn Glu Arg Gly Ser Gln Ser Val Pro Ala Thr Leu Pro Ala Ser Arg Asn Asn 40 Leu Ser Leu Ile Thr His Val His Arg Pro Asp Ser Thr Tyr Ser Pro 60 55 Ala Pro Asp Ala Arg Val Thr Val Ser Asp Gly Val Tyr Asn Arg Ile 75 70 Gly Lys Met Asn Ile Thr Gln Ala Ser Lys Ser Gly Gly Ile Val Ser 90 Asn Ile Gly Phe Asp Glu Ser Glu Leu Tyr Ser Glu Trp Asn Ala Val 105 100 Ser Leu Arg Ser Leu Ser Ala Pro Val Ile Arg Pro Glu Gly Gly Thr 125 120 Thr Gly Val Ile Ser Leu Leu Asn Ser Ile Met Asn Glu Thr Ile Val 140 135 Asp Asp Ala Leu Ser Ile Phe Pro Ile Cys Val Ser Ile Pro Ser His 155 Ala Thr Thr Val Asp Asp Thr Glu Thr Thr Thr Tyr Tyr Pro Glu Tyr

170



Ser Asp Gln Val Ser Asp Ile Glu Ile Pro Phe Thr Val Pro Thr Gln 660

Glu Asp Tyr Glu Ala Asn Lys Glu Phe Phe Ile Lys Glu Ile Asn Tyr 675

Ser Phe Asp Leu Tyr Tyr Lys Val Arg Val Pro Asn Gly Gln Thr Ser 690

Gln Gly Asp Ile Ile Trp Lys Asp Lys Glu Tyr Gly Gly Val His Tyr 705

Ala Ile Thr Tyr Gly Leu Ser Val Lys Ala Glu Leu Leu 725

<210> 5671 <211> 73 <212> PRT <213> B.fragilis

<400> 5671

Gln Phe Pro Leu Leu Pro Leu Ala Arg Leu Ile Asn Leu Ile Phe Ile

1 5 10 15

Ile Leu Phe Phe Leu Met Gln Ile Ala Gly Asn Phe Tyr Gly Lys Leu
20 25 30

Ser Ala Asn Ile His Lys Lys Gly Asn Asn Gln Thr Leu Val Phe Phe

Phe Leu Ser Met Lys Ser Val Ile Phe Ala Lys Ile Ser Lys Ala Ile 50 55 60

Ala Ala Thr Lys Pro Ile Ala Ala Lys

<210> 5672 <211> 149 <212> PRT <213> B.fragilis

<400> 5672

Lys Tyr Lys Leu Met Ile Tyr Lys Phe Leu Phe Pro Leu Lys Pro Asp Ser Ala Gly Ala Ser Leu Phe Leu Leu Ile Leu Arg Ile Ser Phe Gly 25 Leu Leu Leu Met Asn His Gly Ile Gln Lys Trp Ser Asn Phe Gln Glu Leu Ser Ile Ser Phe Pro Asp Pro Leu Gly Leu Gly Ser Pro Leu Ser 55 Leu Gly Leu Ala Val Phe Ala Glu Leu Ala Cys Ser Met Ala Phe Ile 75 Ile Gly Phe Leu Tyr Arg Leu Ala Met Ile Pro Met Ile Phe Thr Met 90 85 Val Ile Ala Phe Phe Val Ile His Ala Asn Asp Val Phe Ala Met Lys 105 100 Glu Leu Ala Leu Val Tyr Leu Ile Ile Phe Val Leu Met Tyr Ile Ser 120 Gly Pro Gly Lys Tyr Ser Val Asp Tyr Val Ile Gly Arg Gln Leu Lys 140 135

Asn Lys Arg Lys Leu 145

<210> 5673 <211> 79 <212> PRT <213> B.fragilis

Lys Phe Thr Gly Tyr Ser His Thr Ala Ala Gly Tyr Ser Gly Ser
65 70 75

<210> 5674 <211> 221 <212> PRT

<213> B.fragilis

<400> 5674 Leu Val Thr Cys Ile Thr Asp Ser Leu Thr Lys Met Lys Lys Leu Leu

Thr Lys Gly Gln Ile Ala Ile Leu Val Ile Phe Ser Val Leu Ile Ile
20 25 30

10

Asp Gln Val Ile Lys Ile Trp Ile Lys Thr His Met Tyr Trp His Glu 35 40 45

Ser Ile Arg Ile Thr Asp Trp Phe Tyr Ile Tyr Phe Thr Glu Asn Asn 50 55 60

Gly Met Ala Phe Gly Met Glu Leu Phe Gly Lys Leu Phe Leu Thr Thr 65 70 75 80

Phe Arg Ile Val Ala Val Gly Leu Ile Gly Trp Tyr Leu Tyr Lys Ile

85 90 95
Val Lys Arg Gly Leu Lys Thr Gly Tyr Ile Ile Cys Val Ser Leu Ile

Leu Thr Gly Ala Leu Gly Asn Ile Ile Asp Ser Val Phe Tyr Gly Val

Ile Phe Asn Glu Ser Thr His Ser Gln Ile Ala Ser Phe Met Pro Asp 130 135 140

Gly Gly Gly Tyr Ser Thr Trp Phe Tyr Gly Lys Val Val Asp Met Phe 145 150 155 160

Tyr Phe Pro Ile Ile Asp Thr Asn Trp Pro Thr Trp Met Pro Phe Val 165 170 175

Gly Glu His Phe Ile Phe Phe Ser Pro Ile Phe Asn Phe Ala Asp 180 185 190

Ala Ala Ile Ser Cys Gly Ile Ile Ala Leu Leu Leu Phe Tyr Ser Lys
195 200 205

Tyr Leu Asn Asp Ser Tyr His His Ser Val Thr Lys Lys 210 215 220

<210> 5675

<211> 334

<212> PRT

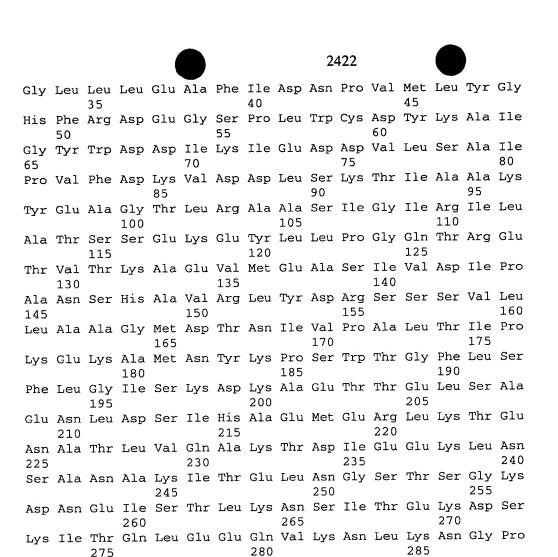
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<400> 5675

Pro Tyr His Cys Asn Lys Ile Ser Ala Met Ser Gln Lys Arg Ile Ile

1 5 10 15

Leu Ser Asp Ser Ser Leu Asn Arg Tyr Gly Tyr Arg Val Leu Thr Ala
20 25 30



<210> 5676 <211> 468 <212> PRT <213> B.fragilis

Thr Pro Gly His Ala Gly Leu Thr Pro Glu Gln Glu Pro Glu Gly Ser

Gly Thr Gln Glu Glu Leu Ser Ala Phe Cys Asp Gln Asn Ala Gly Asn

315

295

Tyr Gln Ala Ile Thr Glu Lys Leu Lys Ala Glu Gly Leu Tyr

310

Val Ile Met Asp Gly Thr Met Pro Lys His Ala Tyr Tyr Met Val His 120 Trp Gly Ser Ser Val Thr Asp Ala Lys Lys Glu Met Ala Met Ala Trp 140 135 Val Lys Gln His Arg Leu Ala His Tyr Ala Asn Gly Leu Ala Ala Ala 155 150 Glu Phe Ala Asn Glu Pro Ile Arg Pro Ile Ala Asp Ser Ile Pro Val 170 Asp Met Arg Lys Val Ile Leu Gly Asp Met Leu Tyr His Asp Thr Arg 185 180 Leu Ser Ala Asp Asn Thr Val Ser Cys Ala Ser Cys His Gly Leu Asn 200 Thr Gly Gly Val Asp Asn Lys Gln Tyr Ser Glu Gly Val Gly Gln 215 220 Phe Gly Gly Val Asn Ala Pro Thr Val Tyr Asn Ala Ala Tyr Asn Phe 235 230 Val Gln Phe Trp Asp Gly Arg Ala Gly Thr Leu Ala Glu Gln Ala Ala 250 245 Gly Pro Pro Leu Asn Pro Val Glu Met Ala Cys Gln Ser Phe Asp Glu 265 Ile Ile Ala Lys Leu Glu Gln Asp Ala Asn Phe Thr Lys Ala Phe Leu 280 Ala Val Tyr Pro Asp Gly Tyr Ser Glu Gln Asn Ile Thr Asn Ala Ile 300 295 Glu Glu Phe Glu Lys Thr Leu Leu Thr Pro Asn Ser Arg Phe Asp Leu 315 310 Tyr Leu Lys Gly Glu Lys Thr Ala Ile Asn Asp Ile Glu Leu Ala Gly 330 325 Tyr Glu Leu Phe Lys Lys Tyr Asp Cys Ala Thr Cys His Val Gly Glu 345 340 Thr Leu Gly Gly Gln Ser Tyr Glu Leu Met Gly Val Lys Arg Asp Tyr 360 Phe Ala Asp Arg Gly Ile Glu Leu Thr Glu Glu Asp Asn Gly Arg Phe 375 Lys Gln Thr Arg Asn Glu Arg Asp Lys His Arg Phe Lys Val Pro Gly 395 390 Leu Arg Asn Ile Ala Leu Thr Ala Pro Tyr Phe His Asp Gly Ser Met 410 405 Lys Thr Met Lys Glu Ala Val Asp Tyr Met Ala Lys Tyr Gln Met Asp 425 Leu Asn Leu Pro Glu Asp Glu Leu Asn Lys Ile Val Ala Phe Leu Glu 440 Thr Leu Thr Gly Glu Tyr Lys Gly Lys Pro Leu Thr Asn Asp Asn Gln 455 Thr Lys Ala Leu 465 <210> 5677 <211> 63 <212> PRT

<213> B.fragilis

<400> 5677

 Val Thr Thr Cys
 Ser Pro Pro Ala Pro Gly Glu Asp Leu Glu Thr Gly

 1
 5
 10
 15

 Val Leu Lys
 Leu Thr Asp Ser Pro Ala Ile Gln Ser Phe Pro Lys Arg
 20
 25
 30

 Val Gly Val Val Glu Asp Val Met Leu Cys Ala Phe Ser Ala Thr Val
 35
 40
 45

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Thr Pro Ser Leu Ala Arg Val Ala Thr Thr Phe Thr Asp Phe Lys 50 55 60
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<210> 5678

<211> 262

<212> PRT

<213> B.fragilis

<400> 5678

Ile Ser Ile Arg Phe Val Leu Tyr Ser Gln Ile Cys Arg Tyr Met Lys 1 5 10 15

Asn Ser Asp Leu Thr Thr Tyr Gly Glu Tyr Leu Glu Lys Leu Ser Pro 20 25 30

Lys His Gly Arg Glu Lys Val Phe Asn Asp Phe Leu Gln Ile Val Val 35 40 45

Cys Cys Leu Ser Met Gly Arg Lys Glu Glu Leu Tyr Phe Lys Thr Ile 50 55 60

Lys Pro Tyr Asp Lys Thr Glu Leu Asp Leu Phe Ser Gln Ala Phe Ala 65 70 75 80

Ala Leu Val Met Gln Met Asp Arg Gln Pro Leu Val Asp Pro Phe Gly 85 90 95

Asp Tyr Phe Gln Glu Phe Leu Ser Asn Ala Gln Asn Gly Gln Phe Phe 100 105 110

Thr Pro Phe Gly Val Cys Glu Leu Met Asn Gln Leu Ile Thr Ala Pro 115 120 125

Lys Val Asn Asp Gln Pro Lys Gln Gly Asp Arg Arg Val Leu Asp Pro 130 135 140

Ala Cys Gly Ser Gly Arg Leu Leu Ser Ala Ala Gln Lys Asp Arg 145 150 155 160

Ala Leu Thr Phe Val Gly Ile Asp Ile Ser Tyr Thr Cys Cys Leu Met 165 170 175

Thr Ile Ile Asn Leu Cys Leu Asn Ser Leu Asn Gly Glu Val Leu His 180 185 190

Met Asn Ala Leu Thr Asp Gln Cys Trp His Arg Trp Leu Ile Ile Val 195 200 205

Asp Ser Val Thr Lys Ile Pro Thr Val Tyr Glu Val Glu Ala Gly Ile 210 215 220

Ile Asn Gln Pro Pro Ala Cys Ala Asp Asp Leu Lys Pro Leu Pro Val 225 230 235 240

Thr Gly Ile Ile Gln Pro Val Lys Asn Met Ile Pro Ala Asn Phe Val 245 250 255

Arg Tyr Thr Pro Lys Cys 260

<210> 5679

<211> 121

<212> PRT

<213> B.fragilis

<400> 5679

Arg Asn Leu Arg Pro Ile Arg Val Ser Glu Pro Ile Pro Leu Arg Thr 1 5 10 15

Ile Phe Thr Ser Ala Pro Thr Asn Ser His Arg Leu Ala Met Ser Phe 20 25 30

Met Lys Leu Île Arg Val Ala Asn Île Glu Phe Ala Ala Tyr Leu Val

Ile Ser Ala Glu Gly Ile Ser Met Asn Ile Thr Arg Lys Leu Phe Ser 50 55 60

Met Asn Gly Leu Tyr Ser Leu Val Ile Asn Phe Ser Ala Arg Ser Asp

<210> 5680 <211> 300 <212> PRT <213> B.fragilis

<400> 5680 Asn Gly Tyr Arg Ile Ile Lys Glu Arg Ile Asp Met Ser Ile Leu Ile 10 Asp Lys Ser Thr Arg Leu Leu Val Gln Gly Ile Thr Gly Arg Asp Gly 25 Leu Phe His Ala Lys Lys Met Ala Glu Tyr Gly Thr Asn Val Val Gly Gly Thr Ser Pro Gly Lys Gly Gly Thr Met Ile Asp Asp Thr Phe Pro 55 Val Phe Asn Thr Met His Glu Ala Val Arg Arg Thr Gln Ala Asn Thr 75 Ser Val Ile Phe Val Pro Ala Arg Phe Ala Ala Asp Ala Ile Met Glu 90 85 Ala Ala Asp Ala Gly Ile Arg Leu Ile Ile Cys Ile Thr Glu Gly Ile 105 Pro Thr Leu Asp Val Ile Lys Ala Tyr Arg Phe Val Glu Leu Lys Gly 120 Ala Lys Leu Ile Gly Pro Asn Cys Pro Gly Leu Ile Ser Pro Gly Glu 140 135 Ser Leu Val Gly Ile Leu Pro Gly Gln Val Phe Thr Pro Gly Asn Ile 155 150

Gly Val Ile Ser Arg Ser Gly Thr Leu Thr Tyr Glu Ile Val Ser His 165 170 175 Leu Thr Ala Lys Gly Met Gly Gln Ser Thr Ala Ile Gly Met Gly Gly 180 185 190

Asp Pro Val Val Gly Leu Tyr Phe Arg Asp Leu Leu Gly Met Leu Gln 195 200 205

Asn Asp Pro Gln Thr Asp Ala Ile Val Met Ile Gly Glu Ile Gly Gly 210 215 220

Asn Ala Glu Glu Leu Ala Ala Thr Tyr Ile Arg Glu His Val Thr Lys 225 230 235 240 Pro Val Val Ala Phe Ile Ala Gly Arg Ser Ala Pro Pro Gly Lys Gln

245 250 255

Met Gly His Ala Gly Ala Ile Ile Ser Gly Ser Ser Gly Ser Ala Thr
260 265 270

Glu Lys Ile Ser Ala Leu Glu Ala Ala Gly Ile Arg Val Ala Gly Glu 275 280 285

Pro Ser Glu Ile Pro Asp Leu Leu Lys Gly Ser Phe 290 295 300

<210> 5681

<211> 586

<212> PRT

<213> B.fragilis

<400> 5681

Ser Lys Arg Leu Ile Lys Ala Ile Glu Ile Ile Lys Leu Ser Ile Leu Asn Ser Ile Tyr Lys Met Lys Asn Glu Asn Lys Met Ile Ile Tyr Gln 25 Val Phe Thr Arg Leu Phe Gly Asn Asn Asn His Cys Ile Tyr Asn Gly Asp Ile Ser Gln Asn Gly Cys Gly Lys Met Ala Asp Phe Thr Ala Lys Ala Leu Gly Glu Ile Lys Lys Leu Gly Ala Thr His Ile Trp Tyr 70 Thr Gly Ile Ile Glu His Ala Ser Gln Thr Asp Tyr Arg Arg Tyr Asn 85 90 Ile Arg Pro Asp His Pro Ala Ile Val Lys Gly Lys Ala Gly Ser Pro 105 100 Tyr Ala Ile Lys Asp Tyr Tyr Asp Val Asp Pro Asp Leu Ala Thr Asp 125 120 Val Pro Gly Arg Met Lys Glu Phe Glu Asn Leu Val Ser Arg Thr His 135 Arg Ala Gly Leu Lys Val Ile Ile Asp Phe Val Pro Asn His Val Ala 155 Arg Gln Tyr His Ser Asp Ala Gln Pro Asp Gly Thr Thr Gln Leu Gly 170 165 Ala Asn Asp Asp Pro Asn Tyr Ser Phe Ser Pro Tyr Asn Asn Phe Tyr 185 Tyr Ile Pro Gln Ser Glu Leu His Gly Gln Phe Asp Met Thr Gly Asn 200 195 Ala Leu Glu Pro Tyr His Glu Phe Pro Ala Lys Ala Thr Gly Asn Asn 220 215 Arg Phe Asp Ala Tyr Pro Asn Ile Asn Asp Trp Tyr Glu Thr Val Lys 230 235 Leu Asn Tyr Gly Val Asp Tyr Gln Asn Gly Gly Thr Cys His Phe Ser 250 245 Pro Thr Pro Asp Thr Trp Thr Lys Met Leu Asp Ile Leu Leu Phe Trp 265 260 Ser Ser Lys Asn Ile Asp Gly Phe Arg Cys Asp Met Ala Glu Met Val 280 Pro Val Glu Phe Trp Glu Trp Ala Ile Pro Gln Val Lys Gln Glu Tyr 295 Pro Asn Ile Ile Phe Ile Ala Glu Val Tyr Asn Pro His Glu Tyr Lys 315 310 Asn Tyr Leu Phe Arg Gly Lys Phe Asp Phe Leu Tyr Asp Lys Val Gly 330 325 Leu Tyr Asp Thr Leu Arg Asn Val Ala Cys Gly Tyr Asp Ser Ala Thr 340 345 Ala Ile Thr Arg Ser Trp Gln Ser Leu Gly Gly Ile Glu Lys Arg Met 360 355 Leu Asn Phe Leu Glu Asn His Asp Glu Gln Arg Ile Ala Ser Asp Phe 380 375 Phe Ala Gly Asp Pro Arg Lys Gly Val Pro Ala Leu Ile Val Ser Ala 395 Cys Met Asn Thr Asn Pro Met Met Ile Tyr Phe Gly Gln Glu Phe Gly 410 405 Glu Met Gly Met Asp Ser Glu Gly Phe Ser Gly Arg Asp Gly Arg Thr 425 420 Thr Ile Phe Asp Tyr Trp Ser Val Asp Thr Ile Arg Arg Trp Arg Asn 440 Glu Gly Lys Phe Asp Gly Lys Met Leu Thr Glu Glu Gln Lys His Leu 455 Tyr Ala Ile Tyr Gln Arg Val Leu Thr Leu Cys Asn Glu Glu Gln Ala

480 475 470 Ile Ser Asn Gly Val Phe Phe Asp Leu Met Tyr Ala Asn Glu Asn Gly 485 490 Trp Arg Phe Asn Glu His Lys Gln Tyr Thr Phe Met Arg Lys Tyr Lys 510 500 505 Asn Glu Leu Leu Phe Ile Val Val Asn Phe Asp Asn Gln Pro Val Asn 520 Val Ala Ile Asn Val Pro Ser His Ala Phe Asp Phe Leu Gln Ile Pro 535 Gln Phe Asp Ser Tyr Lys Ala Val Asp Leu Leu Thr Asp Lys Val Glu 555 550 Glu Ile Ser Leu Leu Pro Tyr Lys Ala Thr Glu Ile Ala Leu Gly Ala 570 565 Tyr Thr Gly Lys Ile Leu Lys Ile Lys Phe

<210> 5682 <211> 64 <212> PRT

<213> B.fragilis

<400> 5682

<210> 5683 <211> 258 <212> PRT <213> B.fragilis

<400> 5683

Phe Gln Ser Arg Ser Met Cys Ser Glu Pro Asp Thr Phe Val Gln Thr 10 Leu Lys Asn Ile Lys Met Lys Lys Val Ile Ile Ile Gly Ala Thr Ser 25 Gly Ile Gly Lys Gly Leu Ala Glu Arg Phe Leu Arg Glu Gly Asn Thr 40 Val Gly Ile Thr Gly Arg Arg Glu Asp Lys Leu Gln Glu Ile Cys Ser 60 55 Gln Asn Lys Asn Cys Phe Tyr Ser Val Ser Asp Val Thr Lys Asp Thr 75 70 Asp Thr Val Arg Gln Leu Ser Asn Leu Val Asn Arg Val Gly Gly Met 90 85 Asp Ile Leu Ile Phe Cys Ser Gly Ile Gly Glu Leu Asn Pro Glu Leu 105 100 Asp Tyr Leu Leu Glu Lys Pro Thr Leu Leu Thr Asn Val Ile Gly Phe 125 120 Thr Asn Val Val Asp Trp Ala Phe His Phe Phe Gln Lys Gln Glu Trp 140 135 Gly His Leu Ile Val Ile Ser Ser Val Gly Gly Met Arg Gly Glu Gly 155 Ile Ala Pro Ala Tyr Asn Ala Ser Lys Ala Tyr Gln Ile Asn Tyr Thr

165

Glu Gly Leu Arg Lys Lys Thr Ala Lys Leu Pro Tyr Pro Ile Tyr Ile
180

Thr Asp Val Arg Pro Gly Phe Val Asp Thr Ala Met Ala Lys Gly Glu
195

Gly Leu Phe Trp Ile Thr Pro Leu Asp Lys Ala Val Gln Gln Ile Tyr
210

Arg Ala Ile Leu Arg Arg Arg Lys Val Ala Tyr Val Ser Lys Arg Trp
225

Lys Tyr Val Ala Leu Leu Leu Arg Met Ile Pro Ala Ser Ile Tyr Cys
245

Lys Met

<210> 5684

<211> 472

<212> PRT

<213> B.fragilis

<400> 5684

Lys His Lys Arg Met Lys Asn Phe Met Asp Lys Asn Phe Leu Gln 1 5 10 15

Thr Glu Thr Ala Gln Glu Leu Tyr His Asn His Ala Ala Lys Met Pro 20 25 30

Ile Ile Asp Tyr His Cys His Leu Asn Pro Gln Met Val Ala Asp Asp 35 40 45

Tyr Arg Phe Lys Ser Leu Thr Glu Ile Trp Leu Gly Gly Asp His Tyr 50 55 60

Lys Trp Arg Ala Met Arg Ser Asn Gly Val Asp Glu Cys Phe Cys Thr 65 70 75 80

Gly Lys Glu Thr Ser Asp Trp Glu Lys Phe Glu Lys Trp Ala Glu Thr 85 90 95 Val Pro Tyr Thr Phe Arg Asn Pro Leu Tyr His Trp Thr His Leu Glu

100 105 110

Leu Lys Thr Ala Phe Gly Ile Asp Lys Val Leu Asn Pro Lys Thr Ala

115 120 125 Arg Glu Ile Tyr Asp Glu Cys Asn Glu Lys Leu Ser Ser Gln Glu Tyr

130 135 140 Ser Ala Arg Gly Met Met Arg Arg Tyr His Val Glu Thr Val Cys Thr

145 150 155 160
Thr Asp Asp Pro Ile Asp Ser Leu Glu Tyr His Ile Arg Thr Arg Glu
165 170 175

Ser Gly Phe Glu Ile Lys Met Leu Pro Thr Trp Arg Pro Asp Lys Val

Met Ala Val Glu Val Pro Ser Asp Phe Arg Thr Tyr Ile Glu Lys Leu 195 200 205

Ser Glu Ile Ser Glu Ile Thr Ile Ser Asp Tyr Asn Asp Met Ile Leu 210 215 220

Ala Leu Arg Lys Arg His Asp Tyr Phe Ala Glu Gln Gly Cys Lys Leu 225 230 235 240

Ser Asp His Gly Ile Glu Glu Phe Tyr Ala Glu Asp Tyr Thr Glu Gly 245 250 255

Glu Ile Lys Thr Ile Phe Asn Lys Ile Tyr Gly Gly Ser Glu Leu Thr 260 265 270

Lys Glu Glu Val Leu Lys Phe Lys Ser Ala Met Leu Ile Val Leu Gly 275 280 285

Glu Met Asp Trp Glu Lys Gly Trp Thr Gln Gln Phe His Tyr Gly Ala 290 295 300

Ile Arg Asn Asn Asn Ser Arg Met Phe Lys Leu Leu Gly Pro Asp Thr 305 310 315 320

Gly Phe Asp Ser Ile Gly Glu Phe Ala Thr Ala Lys Ala Met Ser Lys 330 325 Phe Leu Asp Arg Leu Asn Ser Lys Gly Lys Leu Thr Lys Thr Ile Leu 345 340 Tyr Asn Leu Asn Pro Cys Ala Asn Glu Val Ile Ala Thr Met Ile Gly 360 Asn Phe Gln Asp Gly Ser Ile Pro Gly Lys Ile Gln Phe Gly Ser Gly 375 380 Trp Trp Phe Leu Asp Gln Lys Asp Gly Met Glu Arg Gln Leu Asn Ala 395 390 Leu Ser Leu Leu Gly Leu Leu Ser Arg Phe Val Gly Met Leu Thr Asp 405 410 Ser Arg Ser Phe Leu Ser Tyr Pro Arg His Glu Tyr Phe Arg Arg Thr 425 Leu Cys Asn Leu Leu Gly Cys Asp Val Glu Asn Gly Glu Ile Pro Leu 440 445 Ser Glu Met Glu Arg Val Cys Gln Met Val Glu Asp Ile Ser Tyr Phe 455 Asn Ala Lys Asn Phe Phe His Phe

<210> 5685 <211> 257 <212> PRT

<213> B.fragilis

<400> 5685

Ser Gly Gly Arg Asp Ser Tyr Leu Pro Leu His Lys Leu Asn Asn Tyr 10 Leu Ile Met Lys Arg Phe Ile Leu Cys Ile Ser Cys Leu Leu Ile Cys 25 Cys Leu Phe Leu Leu Pro Glu Val Gln Ala Ala Ile Pro Asp Thr Gly Asn Trp Ile Ser His His Leu Leu Thr Ser Asp Gly Leu Thr Val Leu Ala Ala Gly Pro Ala Phe Ala Pro Leu Lys Trp Asn Ile Gly Gln Asn Asn Met Gly Gly Tyr Lys Gly Arg Leu Leu Phe Ile Pro Tyr Asp Ala 90 Pro Ser Thr Val Pro Met Ile Pro Ala Lys Pro Thr Thr Asn Glu Asp 105 100 Leu Ile Thr Ala Ser Gly Ser Phe Thr Phe Pro Ser Gly Gly Thr Tyr 125 120 Thr Gln Pro Ile Tyr Leu Tyr Ser Thr Lys Gly Lys Val Gly Tyr Lys 140 135 Ala Glu Ile Gln Gly Glu Thr Asp Gly Lys Ser Phe Lys Gln Thr Leu 155 150 Glu Phe Phe Phe Pro Gly Asn Thr Pro Gly Met His Ala Phe Ser Thr 170 165 Leu Val Lys Asn Thr Pro Gly Tyr Phe Val Phe Glu Asp Ser Asp Gly 185 180 Gln Gln Phe Leu Met Gly Lys Pro Gly Met Tyr Ala Asp Val Ser Pro 205 200 Ser Phe Asp Gly Gly Lys Leu Ala Ala Asp Gln Arg Gly Thr Ala Tyr 220 215 Thr Ala Thr Cys Asp Ala Asn Glu Ser Ala Val Val Leu Gly Thr Pro 235 230 Ile Asp Met Glu Val Ile Ala Gly Leu Lys Pro Ala Pro Ser Pro Gly 250 245

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<210> 5686
<211> 130
<212> PRT
<213> B.fragilis
<400> 5686
Ile Ile Met Ser Leu Asn Asp Arg Leu Arg Ile Val Val Asn Glu Phe
                                    10
Phe His Gly Asn Lys Ala Ala Phe Ala Arg Ala Ala Lys Ile Ser Asp
                                25
Gln Arg Ala Tyr Ser Cys Leu Ser Val Arg Ser Asn Thr Glu Pro Pro
                                                45
                            40
Ala Arg Val Leu Glu Asn Leu Ala Lys Tyr Leu Pro Asn Leu Asn Ala
                        55
Thr Trp Leu Leu Thr Gly Glu Gly Glu Met Ile Gln Asp Lys Ser Thr
                                        75
                    70
Pro Glu Met Pro Ile Thr Leu Val Ser Val Asn Glu Tyr Lys Ser Arg
Leu Gln Gln Met Glu Val Arg Leu Glu Ala Leu Arg Ala Gln Val Val
                                105
Leu Lys Asp Lys Leu Leu Ala Gly Leu Leu Arg Lys Val Glu Asn Lys
Thr Lys
  130
<210> 5687
<211> 198
<212> PRT
<213> B.fragilis
<400> 5687
Asn Asn Met Ser Pro Arg Lys Leu Met Phe Trp Leu Phe Ala Cys Ile
Phe Leu Val Cys Ala Leu Arg Ala Gly Leu Leu Thr Ser Ala Asp Gln
                                 25
            20
Tyr Ile Tyr His Leu Arg Asn Met His Ala Ser Thr Phe Ala Tyr Arg
                            40
Tyr Asp Asp Phe Leu Pro Tyr Leu Pro Ile Val Ala Met Phe Val Leu
                        55
Lys Leu Thr Gly Val Lys Ser Arg Ser Asn Trp Lys Arg Met Leu Val
                    70
                                         75
Ser Thr Ala Phe Ser Tyr Ile Leu Met Gly Ala Ile Val Leu Thr Met
                                     90
                85
Lys Ser Leu Ala Gly Val Leu Arg Pro Asp Gly Ser Asp Phe Leu Ser
                                105
Phe Pro Ser Gly His Thr Ala Thr Ala Phe Thr Ala Ala Thr Leu Leu
Tyr Lys Glu Tyr Gly Phe Lys Thr Pro Leu Ala Gly Ile Ala Thr Phe
                                             140
                        135
Leu Pro Ala Val Val Thr Gly Phe Thr Arg Gln Leu Asn Asn Arg His
                                         155
                    150
Trp Leu Ser Asp Val Leu Ala Gly Ala Ile Ile Gly Ile Met Met Val
                                     170
               165
Glu Leu Ala Tyr Phe Leu Thr Asp Arg Leu Leu Met Lys Thr Gly Ala
                                185
Gln Thr Cys Ser Lys Ser
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<210> 5688

<211> 532 <212> PRT <213> B.fragilis <400> 5688 Lys Leu Ser Gly Tyr Lys Asp Lys Ala Tyr Leu Cys Asn Val Phe Leu Ile Gln Val Thr Met Asp Tyr Pro His Lys Ile Asn Lys Val Gln Ile 25 Arg Asn Leu Gln Ile Glu Asp Tyr Ala Gln Leu Ser Gln Ser Phe Thr 40 Arg Val Tyr Ser Asp Gly Ser Asp Val Phe Trp Thr His Glu Gln Ile 55 60 Glu Lys Leu Ile Lys Ile Phe Pro Glu Gly Gln Ile Val Thr Val Val Asp Glu Lys Ile Val Gly Cys Ala Leu Ser Ile Ile Val Glu Tyr Asp Lys Val Lys Asn Asp His Thr Tyr Ala Gln Val Thr Gly Lys Glu Thr 105 100 Phe Asn Thr His Ser Pro Gln Gly Asn Ile Leu Tyr Gly Ile Glu Val 120 Phe Ile His Pro Glu Tyr Arg Gly Leu Arg Leu Ala Arg Arg Met Tyr 135 Glu Tyr Arg Lys Glu Leu Cys Glu Thr Leu Asn Leu Lys Ala Ile Met 155 150 Phe Gly Gly Arg Ile Pro Asn Tyr His Lys Tyr Ala Asp Lys Met Arg 170 165 Pro Lys Glu Tyr Ile Asp Arg Val Arg Gln Arg Glu Ile Tyr Asp Pro 185 Val Leu Thr Phe Gln Leu Ser Asn Asp Phe His Val Arg Lys Val Met 200 Thr Asn Tyr Leu Pro Asn Asp Glu Glu Ser Lys His Tyr Ala Cys Leu 220 215 Leu Gln Trp Asp Asn Ile Tyr Tyr Gln Pro Pro Thr Gln Glu Tyr Leu 235 230 Ala Pro Lys Thr Thr Val Arg Val Gly Leu Val Gln Trp Gln Met Arg 250 Ser Tyr Lys Thr Leu Asp Asp Leu Phe Glu Gln Val Glu Phe Phe Val 265 260 Asp Ala Val Ser Asp Tyr Lys Ser Asp Phe Val Leu Phe Pro Glu Tyr 280 Phe Asn Ala Pro Leu Met Ser Lys Tyr Asn Asp Lys Gly Glu Ser Gln 295 Ala Ile Arg Gly Leu Ala Gln Tyr Thr Glu Glu Ile Arg Asp Arg Phe 315 310 Ile Asn Leu Ala Ile Ser Tyr Asn Ile Asn Ile Ile Thr Gly Ser Met 330 Pro Leu Ile Lys Glu Asp Gly Leu Leu Tyr Asn Ala Gly Phe Leu Cys 345 Arg Arg Asp Gly Thr Tyr Glu Met Tyr Glu Lys Leu His Val Thr Pro 360 Asp Glu Ile Lys Ser Trp Gly Leu Ser Gly Gly Lys Gln Leu Lys Thr 380 375 Phe Asp Thr Asp Cys Ala Lys Ile Gly Ile Leu Ile Cys Tyr Asp Val 395 Glu Phe Pro Glu Leu Ser Arg Leu Met Ala Asp Gln Gly Met Gln Ile

410 405 Leu Phe Val Pro Phe Leu Thr Asp Thr Gln Asn Ala Tyr Ser Arg Val 425 Arg Val Cys Ala Gln Ala Arg Ala Ile Glu Asn Glu Cys Phe Val Val 440 Ile Ala Gly Ser Val Gly Asn Leu Pro Arg Val His Asn Met Asp Ile 455 Gln Tyr Ala Gln Ser Gly Val Phe Thr Pro Cys Asp Phe Ala Phe Pro 475 470 Thr Asp Gly Lys Arg Ala Glu Ala Thr Pro Asn Thr Glu Met Ile Leu 490 485 Val Ser Asp Val Asp Leu Asp Leu Leu Asn Glu Leu His Thr Tyr Gly 505 Ser Val Arg Asn Leu Lys Asp Arg Arg Asn Asp Val Tyr Glu Val Arg 520 515 Phe Lys Lys Pro 530 <210> 5689 <211> 139 <212> PRT <213> B.fragilis <400> 5689 Lys Leu Leu Gly Asn Tyr Arg Asp Gln Ile Met Asn Arg Asn Ala Ile

Leu Ser Lys Arg Gln Lys Gln Phe Ile Glu Arg Ile Ala Trp Gly Ala 25 Ser Tyr Lys Glu Val Ala Asp Phe Phe His Val Ser Trp Ser Thr Val 40 3.5 Asp Asn Thr Leu Arg Asn Ala Lys Thr Lys Leu Gly Leu Ser Lys Val 60 55 Thr Glu Leu Gly Ala Trp Trp Phe Cys Thr Asn Tyr Gly Ile Ser Phe 75 Asp Leu Ser Pro Ile Ala Arg Gln Cys Thr Ala Gly Val Ile Leu Leu 90 Leu Phe Ser Leu Gly Glu Val Thr Thr Val Thr Asn Ile Ser Tyr Thr 105 Met Gln Arg Val Arg Arg Pro Arg Thr Glu Tyr Arg Ile Arg Arg His 120 Glu Thr Ser Ile Tyr Gln Pro Tyr Ile Ile Asn

<210> 5690 <211> 430 <212> PRT <213> B.fragilis

130

<400> 5690 Val Phe Gln Gly Gly Ile Leu Phe Phe Leu Leu Leu Tyr Arg Cys Asn Arg Glu Ile Ile Ser Phe Phe Ile Lys Leu Ile Met Asn Asn Trp Lys Lys Lys Phe Ile Ile Ile Trp Thr Gly Gln Leu Phe Ser Ile Leu Ser 40 Ser Ser Ile Ala Gln Phe Ser Ile Val Leu Trp Ile Ser Leu Lys Thr 55 Gly Ser Ala Glu Val Leu Ser Phe Ala Thr Ile Ala Ala Leu Leu Pro Gln Ala Leu Leu Gly Pro Phe Ala Gly Val Phe Val Asp Arg Trp Asn Arg Lys Trp Thr Met Ile Gly Ala Asp Ser Phe Val Ala Leu Cys Ser 105 Gly Val Ile Ala Leu Leu Phe Tyr Leu Asp Ile Ile Glu Leu Trp His 120 Ile Tyr Leu Leu Leu Met Leu Arg Ser Val Gly Gly Ala Phe His Thr 140 135 Pro Ala Met Lys Ser Ser Val Pro Leu Leu Ala Pro Glu Lys Glu Leu 155 150 Met Arg Ile Ala Gly Ile Asn Gln Ala Ile Gln Ser Ile Cys Asn Ile 165 170 Gly Gly Pro Ala Leu Gly Ala Ile Leu Leu Leu Ala Phe Asp Met Ser 185 180 Leu Val Met Leu Leu Asp Val Leu Gly Ala Ile Ile Ala Cys Thr Ala 200 Leu Leu Phe Val Tyr Ile Pro Asn Pro Lys Gln Glu Asn Thr Ser Ala 215 Lys Asn Val Leu Tyr Asp Met Arg Asp Gly Phe Asn Val Ile Met Arg 235 Asn Lys Gly Val Ser Trp Val Met Val Thr Glu Val Leu Val Thr Phe 250 245 Phe Val Met Pro Met Val Ala Leu Met Pro Leu Met Thr Leu Lys Asn 265 Phe Ser Gly Thr Ala Tyr Gln Val Ser Leu Ile Glu Thr Leu Phe Gly 280 275 Ala Gly Met Leu Ala Gly Gly Ala Leu Leu Gly Val Trp Asn Pro Lys 300 295 Ile Arg Lys Thr Leu Leu Ile Ala Ile Ser Tyr Phe Leu Leu Gly Ala 310 315 Ala Leu Ala Phe Cys Gly Ile Leu Pro Ala Asp Gly Phe Val Leu Phe 330 325 Ala Ala Leu Thr Val Ala Gln Gly Ile Val Val Pro Phe Phe Ser Gly 345 340 Pro Phe Thr Ser Leu Leu Gln Thr Gln Phe Lys Pro Ala Tyr Leu Gly 365 360 Arg Val Phe Ser Leu Phe Asp Ser Val Ser Leu Leu Pro Ser Ile Ile 375 Gly Leu Phe Ile Thr Gly Phe Ile Ala Asp Ser Leu Gly Ile Ala Asn 395 390 Ile Phe Ile Cys Cys Gly Ile Ala Ile Val Phe Thr Ser Ile Leu Met 410 405 Met Cys Ile Pro Ala Val Arg Asp Leu Glu Lys Gln Ser Lys 425

<210> 5691

<211> 131

<212> PRT

<213> B.fragilis

<400> 5691

Ile Ser Lys Asp Ile Tyr Ser Phe Asp Leu Ala Thr Ala Tyr Phe Val Leu Cys Ser Asn Tyr His Phe Arg Gly Ser Ile Val Thr Thr Gln Arg 90 Leu Tyr Glu Leu Ala Ala Arg Gly Ile Cys Val Cys Val Gly Val Lys 105 Ser Leu Pro Arg Glu Tyr Glu Leu Leu Ser Gln Val Phe Tyr Pro Asn 120 Asp Leu Arg 130 <210> 5692 <211> 431 <212> PRT <213> B.fragilis <400> 5692 Thr Leu Thr Ile Lys Lys Ser Ile Gln Met Ala Ala Asn Lys Leu Ile Asp Val Ser Lys Leu Asn Glu Ala Leu Val Ile Tyr Asp Gln Ala Leu Arg Ala Leu Pro Phe Ala Thr Leu Thr Glu Val Ala Asn Leu Leu Lys 40 Leu Asn Val Met Asp Leu Gln Gly Lys His Ala Arg Ile Asn Glu Arg Arg Arg Ala Gly Gly Thr Gln Ser Tyr Lys Ile Gly Lys Asn Phe Gly 75 70 Leu Val Asp Lys Leu Leu Gly Tyr Glu Pro Ser Val Ile Glu Pro Lys 90 Asp Val Val Cys Ile Thr Lys Glu Asn Ser Gln Lys Tyr Asp Asp Asn 105 Glu Leu Leu Ile Ile Gly Gly Thr Pro Val Ser Asn Thr Thr Lys Lys 125 120 His Pro Met Glu Thr Lys Val Ala Phe Thr Leu Val Arg Ser His Leu 135 Glu Asp Ile Val Tyr Ser Leu Phe Ser Ala Glu Arg Asp Glu Asp Ser 155 150 Asn Ser Pro Gly Gly Ala Phe Asp Gly Ile Tyr Thr Lys Met Asp Met 170 165 Leu Ile Thr Arg Gly Asp Val Asn Ala Ala Arg Gly Asn Phe Ser Ile 185 Ser Gly Glu Phe Ala Ala Pro Thr Ser Asp Thr Asp Tyr Thr Ala Tyr 200 Glu Asn Leu Val Glu Trp Ile Gly Gly Ala Asn Thr Tyr Leu Arg Ser 215 220 Ser Ile Gly Gly Val Pro Gln Leu Leu Cys Ala Glu Thr Val Leu Lys 230 235 Ala Ala Arg Ser Ala Leu Arg Asn Lys Leu Arg Met Gln Glu Tyr Pro 250 Ser Met Gln Arg Met Leu Glu Leu Leu Arg Glu Asp Ala Met Cys Pro 265 260 Asn Leu Ile Val Ser Ser His Glu Ala Leu Gly Gln Gly Ser Arg Leu 285 280 Thr Leu Gln Lys Val Gly Asn Ile Asp Val Ala Phe Asn Thr Gln Ala 295 Ala Ser Lys Phe Cys Gln Ile Arg Asp Ile Tyr Glu Asp Pro Asn Glu 315 310

Trp Gln Phe Trp Leu Gln Ala Gly Tyr Asp Thr Arg Ile Asn Asp Trp

His Glu Lys Val Phe Arg Cys Asn Glu Gln Lys Asn Glu Ser Leu Asp 345 Leu Ala Gly Asp Tyr Cys Lys Thr Gly Gly Val Gln Val Ala Ile Thr 360 Gly Thr Asp Lys Gly Gln Trp Ser Ile Gln Gly Lys Val Ala Lys Arg 375 Gly Asn Gly Gln Cys Ile Ile Gly Leu Pro Pro Gly Lys Tyr Thr Ile 395 390 Glu Phe Thr Asp Ala Asp Gly Lys Thr Lys Pro Ala Asn Thr Gln Val 410 405 Thr Val Val Ala Gly Glu Val Ala Thr Ala Thr Gly Ala Tyr Thr 425

<210> 5693 <211> 115 <212> PRT <213> B.fragilis

<400> 5693

Val Leu Tyr Ile Met Glu Gln Leu Phe Glu Ala Ile Leu Ala Ile Ala Lys Gln Asn Pro Asp Gly Phe Thr Val Asp Leu Thr Thr Leu Lys Lys 25 Val Thr Lys Gly Ile Ser Val Ala Tyr Leu Glu Thr Gln Asp Ser Phe

Gly Glu Glu Gly Leu Lys Arg Val Leu Asn His Ala Glu Met His Glu

55 Lys Lys Val Gly Gly Trp Leu Asn Glu Glu Asn Gln Glu Phe Tyr Phe

70 Asp Ser Val Arg Ile Phe Thr Asn Leu Glu Glu Ala Lys Arg Phe Gly 90

Cys Glu Asn Lys Gln Ile Ala Ile Phe Asp Ile Ser His Met Arg Leu 105

Ile Lys Leu 115

<210> 5694 <211> 255 <212> PRT <213> B.fragilis

85

<400> 5694

Tyr Leu Tyr Ile Cys Ser Asn Gln Arg Leu Asn Ile Met His Asp Ile 1.0 Pro Lys Gln Ile Pro Leu Ala Asn Asn His Ile Ser Val Asp Cys Val 2.0 Val Ile Gly Phe Asp Gly Glu Gln Leu Lys Val Leu Leu Ile Asn Arg 40 Ile Gly Glu Glu Asn Gly Lys Val Tyr Arg Asp Met Lys Leu Pro Gly 55 Ser Leu Ile Tyr Met Asp Glu Asp Leu Asp Glu Ala Ala Gln Arg Val 75 Leu Phe Glu Leu Thr Gly Ile Arg Asn Val Asn Leu Met Gln Phe Lys 90 Ala Phe Gly Ser Lys Asn Arg Thr Ser Asn Pro Lys Asp Val His Trp 105 Leu Glu Arg Ala Met Gln Ser Lys Val Glu Arg Ile Val Thr Ile Ala 120

Tyr Leu Ser Met Val Lys Ile Asp Arg Ala Leu Asp Lys Asn Leu Asp

140 135 Glu Phe Gln Ala Cys Trp Val Ala Leu Lys Asp Ile Lys Thr Leu Ala 155 150 Phe Asp His Asn Leu Ile Ile Arg Glu Ala Leu Thr Tyr Ile Arg Gln 170 165 Phe Val Glu Phe Asn Pro Ser Met Leu Phe Asp Leu Leu Pro Arg Lys 185 Phe Thr Ala Ser Gln Leu Arg Ile Leu Phe Glu Leu Val Tyr Asp Lys 200 Ala Val Asp Val Arg Asn Phe His Lys Lys Ile Ala Leu Met Asp Tyr 220 215 Val Val Pro Leu Glu Glu Lys Gln Thr Gly Val Ala His Arg Ala Ala 235 230 Arg Tyr Tyr Lys Phe Asp Arg Lys Ile Tyr Asn Lys Thr Arg Arg 250 245

<210> 5695 <211> 773

<212> PRT

<213> B.fragilis

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295 300 Gly Asp Leu Tyr Asp Glu Arg Asn Val Gln Lys Thr Tyr Thr Tyr Phe 315 310 Gly Arg Leu Ser Ala Leu Lys Tyr Thr Asn Ile Arg Phe Phe Glu Thr 330 325 Gln Asn Gly Asp Ser Thr Gln Leu Asn Cys Tyr Val Met Leu Thr Lys 345 Ser Lys His Lys Ser Ile Ser Phe Glu Leu Glu Gly Thr Asn Ser Ala 360 Gly Asp Leu Gly Ala Ala Ala Ser Val Ser Phe Gln His Arg Asn Leu 380 375 Phe Arg Gly Ser Glu Thr Phe Met Val Lys Phe Arg Gly Ala Tyr Glu 395 390 Ala Ile Ser Gly Leu Gln Pro Gly Tyr Lys Asn His Asn Tyr Thr Glu 410 405 Tyr Gly Val Glu Thr Ser Ile Asn Phe Pro Asn Phe Leu Phe Pro Phe 425 420 Leu Thr Ser Asp Phe Lys Arg Ile Lys Ala Thr Thr Glu Phe Gly 440 Leu Gln Tyr Asn Tyr Gln Leu Arg Pro Glu Phe Ser Arg Thr Ile Ala 455 Ser Ala Ser Trp Ser Tyr Lys Trp Ile Gln Lys Gln Lys Ile Gln His 475 470 Arg Ile Asp Leu Leu Asp Ile Ser Tyr Leu Tyr Leu Pro Trp Ile Ser 490 485 Ser Gln Phe Gln Glu Asp Tyr Ile Asn Lys Asp Lys Asp Asn Tyr Ile 505 500 Leu Lys Tyr Asn Tyr Glu Asn Arg Leu Ile Val Arg Met Gly Tyr Asn 520 525 515 Tyr Ser Tyr Asn Ser Ala Gly Gly Thr Leu Val Asn Asn Thr Ile Thr 535 Thr Asn Ser Tyr Ser Ile Arg Ala Gly Phe Glu Ser Ala Gly Asn Ile 555 Leu Tyr Gly Ile Ser Lys Met Ile Asn Met Arg Lys Asn Lys Asp Gly 570 565 Glu Tyr Ala Ile Leu Gly Ile Pro Tyr Ala Gln Tyr Leu Lys Gly Asp 585 Phe Asp Phe Ala Lys Asn Ile Ile Ile Asp His Arg Asn Ser Leu Ala 600 Phe His Ala Gly Ile Gly Ile Ala Val Pro Tyr Gly Asn Ala Lys Val 615 620 Val Pro Phe Glu Lys Arg Tyr Phe Ser Gly Gly Ala Asn Ser Val Arg 635 630 Gly Trp Ser Val Arg Asn Leu Gly Pro Gly Ser Phe Ala Gly Asp Gly 650 645 Asn Phe Met Asn Gln Ser Gly Asp Ile Lys Leu Asp Ala Ser Ile Glu 665 660 Tyr Arg Thr Arg Leu Phe Trp Lys Phe Arg Gly Ala Ala Phe Ile Asp 685 680 Ala Gly Asn Ile Trp Thr Ile Arg Glu Tyr Glu Asn Gln Pro Gly Gly 695 Val Phe Glu Phe Asp Lys Phe Tyr Lys Gln Ile Ala Val Ala Tyr Gly 715 710 Leu Gly Leu Arg Leu Asp Leu Asp Phe Phe Val Leu Arg Phe Asp Gly 730 725 Gly Met Lys Ala Ile Asn Pro Lys Tyr Lys Lys Ala Lys Glu Arg Tyr 745 Pro Ile Ile His Pro Arg Phe Ser Arg Asp Phe Ala Phe His Phe Ala 760 755

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195 200 205 Asp His Gln Asn Pro Val Ile Leu Lys Asp Ala Ala Gly Thr Leu Ser

Val Ser Ser Glu Ser Asp Met Trp Thr Val Thr Glu Gly Trp Arg Tyr

Met Phe Gly Ser Glu Ala Phe Pro Ala Ala Phe Phe Gly Met Leu Leu

215

230

220

250 245 Phe Phe Val Pro Lys Thr Pro Arg Tyr Leu Val Met Ile Asp Gln Asp 265 Gln Lys Ala Tyr Ser Ile Leu Lys Lys Val Asn Gly Ala Thr Lys Ala 280 Gln Glu Ile Leu Ala Glu Ile Lys Ala Thr Ser Gln Glu Lys Thr Glu 295 Lys Leu Phe Thr Tyr Gly Ala Ala Val Ile Val Ile Gly Ile Leu Leu 310 Ser Val Phe Gln Gln Ala Ile Gly Ile Asn Ala Val Leu Tyr Tyr Ala 330 Pro Arg Ile Phe Glu Asn Ala Gly Ala Glu Gly Gly Met Met Gln 345 Thr Val Ile Met Gly Ile Val Asn Ile Val Phe Thr Leu Ile Ala Ile 365 360 Phe Thr Val Asp Arg Phe Gly Arg Lys Pro Leu Leu Ile Ile Gly Ser 375 380 Val Gly Met Ala Val Gly Ala Phe Ala Val Ala Leu Cys Asp Ser Met 395 390 Gly Ile Lys Gly Ile Leu Pro Val Leu Ser Val Ile Val Tyr Ala Ala 410 405 Phe Phe Met Met Ser Trp Gly Pro Ile Cys Trp Val Leu Ile Ser Glu 425 Ile Phe Pro Asn Thr Ile Arg Gly Lys Ala Val Ala Ile Ala Val Ala 440 435 Phe Gln Trp Ile Phe Asn Tyr Ile Val Ser Ser Thr Phe Pro Ala Leu 460 455 Tyr Asp Phe Ser Pro Met Phe Ala Tyr Ser Leu Tyr Gly Ile Ile Cys 475 470 Val Ile Ala Ala Leu Phe Val Trp Arg Trp Val Pro Glu Thr Lys Gly 490 485 Lys Thr Leu Glu Asp Met Ser Lys Leu Trp Lys Arg Arg 505

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155
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Lys Arg Cys Pro Glu Leu Leu Asn Leu Ile Ser Leu Lys Glu Leu Ala
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Ser Tyr Leu Met Ile Cys Pro Glu Thr Leu Ser Arg Leu Arg Arg Lys
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Leu Val Gln Lys
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Thr Asp Tyr Ile His Asn Thr Lys Tyr Arg Met Pro Val Ile Phe Val
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Ile Gln Arg
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Pro Leu Ser Phe Phe Ala Phe Pro Leu Asn Val Ile Val Ala Val Ile
                        55
Trp Ile Tyr Ser Leu Trp Arg Leu Tyr Lys Glu Gly Asn Lys Leu Pro
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                    70
Leu Thr Arg Phe Leu Leu Ser Ser Arg Thr Ser Val Leu Ser Ile Leu
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                85
Leu Leu Ile Gly Gly Ser Leu Val Ile Gly Leu Phe Pro Gln Leu Ser
                                105
Glu Ala Glu Ala Asp Ser Met Pro Gly Val Leu Ala Ser Leu Gly Cys
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Tyr Asn Phe Met Thr Ser Trp Ile Phe Ile Ala Ile Leu Phe Leu Leu
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                         135
Leu Ser Asn Leu Ala Met Val Ile Ile His Ala Phe Tyr His Cys Val
                                         155
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Pro Ala Lys Lys Arg Phe Ile Leu Asn His Leu Gly Leu Trp Leu Ala
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                 165
Leu Phe Ala Gly Phe Phe Gly Ser Ser Asp Val Gln Thr Leu Arg Ile
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 Pro Leu Tyr Thr Gly Gln Pro Gly Arg Glu Ala Tyr Ser Met Asp Gly
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Lys Ala Tyr Tyr Leu Asp Tyr Glu Leu Glu Leu Tyr Ser Phe Asn Thr

215

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2441
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Glu Tyr Tyr Pro Asn Gly Met Pro Ser Arg Phe Ala Ala Asp Val Arg
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                   230
Ile Gly Asn Arg Arg Thr Thr Leu Glu Val Asn His Pro His Cys Tyr
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                                    250
Arg Leu Gly Glu Asp Ile Tyr Leu Thr Gly Tyr Asp Thr Arg Asn Met
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Gly Asn Thr Arg Tyr Cys Ile Leu Gln Ile Val Arg Gln Pro Trp Lys
                           280
Tyr Val Met Val Val Gly Ile Leu Met Met Leu Thr Gly Ala Val Leu
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Arg Glu Lys Ile Thr Phe Pro Glu Arg Lys Arg Tyr Ser Tyr Val Thr
65 70 75 80

Gly Tyr Glu Ile Cys His Asn Glu Val Val Pro Ile Leu Met Lys Ala 85 90 95

Lys Lys Asp Gly Thr Ile Ser Lys Ile Arg Asp Tyr Ile Thr Leu Glu 100 105 110

Arg Val Ile Val Glu Leu Ala 115

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Lys Val Leu Gln Cys Val Arg Leu Pro Gln Asn Gly Lys Gly Thr Ile
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Gly Phe Asn Leu Lys Gly Glu Tyr Leu Lys Lys Tyr Gly Phe Gln Leu 35 40 45

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Lys Thr Gly Asn Val Leu Glu

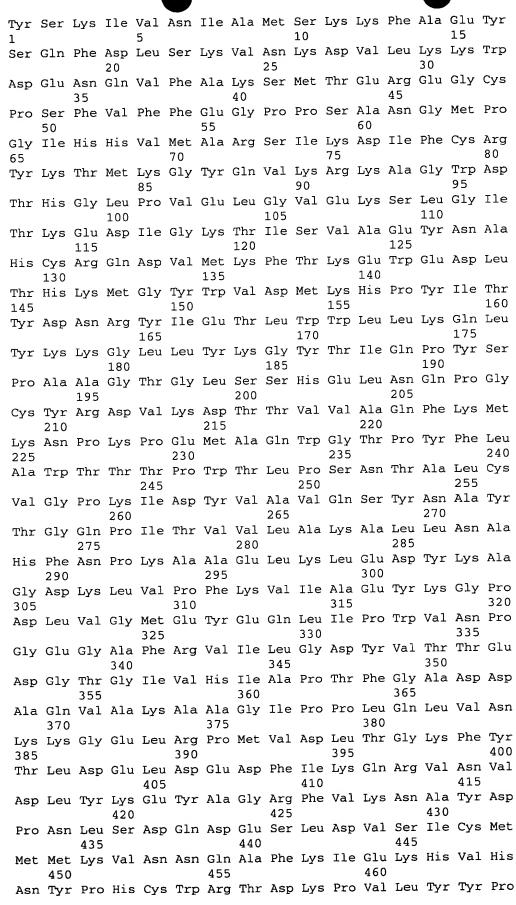
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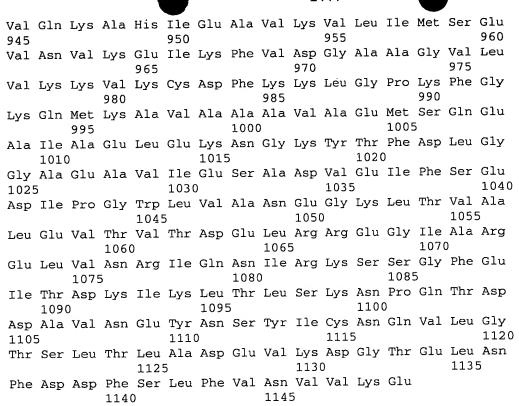
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<212> PRT

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40

Arg Phe Ser Val Leu Tyr Val Ser Ala Cys Thr Gln Tyr Ile Cys Asn

Lys Lys Ala Met Asn Glu Ile Leu Asn Tyr Ile Met Val Phe Leu Phe 75 70

Gly Gly Gly Leu Val Gly Thr Ala Thr Ala Phe Val Thr Ile Lys Tyr 90 85

Thr Lys Lys Arg Ala Glu Ala Asp Ala Met Lys Ala Met Gln Asp Val 105 100

Tyr Gln Glu Met Ile Thr Asp Gln Arg Ser Tyr Ile Asn Ser Leu Lys 125 120

Gln Asp Lys Glu Asp Ser Glu Ala Arg Trp Glu Asn Lys Val Glu Thr 140 135

Leu Ser Lys Arg Ile Glu Thr Met Asp Leu Lys Ile Asn Glu Asn Asn 155 150

Arg Leu Ile Thr Glu Leu Lys Thr Met Lys Cys Thr Asp Leu Ile Cys 170 165

Gln Asn Arg Lys Gln 180

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Ala Leu Ala Asn Arg Ile Pro Leu Ile Pro Val Leu Thr Ala Leu Ala 290

Cys Leu Phe Leu Ala Ser Phe Val Phe Glu Leu Gly Thr Thr His Asp 305

Asp Tyr Phe Ile Pro Ala Arg Val Leu Ala Gly Leu Gly Ala Ile Cys 325

Phe Thr Leu Phe Ser Ile Val Ser Ile Leu Glu Ser Gly Thr Ser Ser 340

Lys

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85 90 95

Arg Ile Thr Gln Lys Gly Glu Ala Phe Leu Lys Lys Leu Thr Leu Asn
100 105 110

Gly Gly Leu Ile Glu Tyr Asp Pro Thr Glu Arg Val Trp Lys Leu Asn
115
120
125

Gly Asn Met Leu Ile Ser Gly Asn Ile Thr Phe Gly Trp Asp Asn Gly 130 135 140

Thr Tyr Thr Ala Pro Thr Leu Leu Asp Leu Leu Pro Tyr Asp Pro Thr 145 150 155 160 Thr Leu Ser Lys Glu Gly Gly Arg Leu Ser Val Ile Asn Ala Gly Ser

165 170 175

Asp Phe Asp Glu Leu Ala Met Trp Gly Val Leu Ser Lys Glu Gly Val
180 185 190

Gln Gln Ile Asp Lys Ser His Leu Ser Gly Ala Leu Ala Gly Tyr Ala 195 200 205

Thr Glu Lys Phe Val Thr Asp Lys Gly Tyr Ile Thr Ser Ser Ala Leu 210 215 220

Thr Gly Tyr Ala Thr Glu Thr Phe Val Arg Glu Asn Phe Val Thr Leu 225 230 235 240 Ala Gly Ala Gln Glu Ile Thr Gly Glu Lys Asp Phe Thr Gly Gly Leu

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Lys Val Asn Gly Gly Leu Leu Asp Tyr Asp Pro Thr Glu Arg Val Trp
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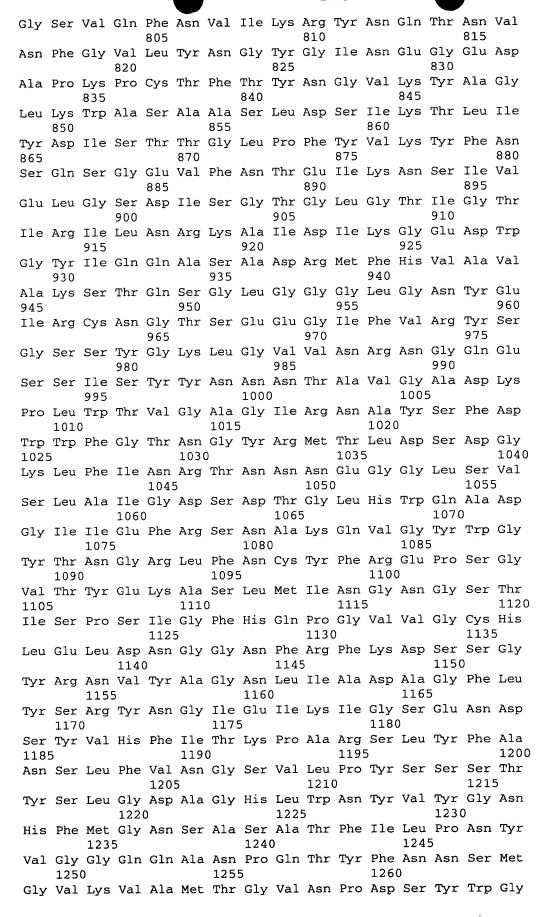
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280
285

Asp Asn Gly Thr Tyr Thr Ala Pro Thr Leu Leu Asp Leu Leu Pro Tyr 290 295 300

Asp Pro Thr Thr Leu Ser Lys Glu Gly Gly Arg Leu Ser Val Ile Gly 305 310 315 320 Ser Ala Gly Ser Ser Phe Asp Glu Ser Ser Met Trp Thr Ala Leu Leu

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Lys	Gly 370		Gly	Leu	Pro	Thr 375	Thr	Glu	Gly	Tyr	Arg 380	Asn	Val	Thr	Glu
Ile 385		Asn	Thr	Leu	Leu 390		Phe	Leu	Thr	Gly 395	Ser	Asp	Thr	Asp	Ser 400
Thr	Ile	Asn	Lys	Trp 405		Glu	Leu	Glu	Ala 410	Phe	Leu	Ala	Gly	Phe 415	Ser
Glu	Thr	Asp	Thr 420		Ala	Thr	Ala	Leu 425	Ser	Val	Lys	Ala	Asp 430	Lys	Thr
Arg	Ser	Ile 435		Thr	Gly	Thr	Gly 440	Leu	Ser	Gly	Gly	Gly 445	Asp	Leu	Ser
Ala	Asp 450	Arg	Thr	Leu	Ser	Leu 455	Ser	Pro	Ser	Gly	Ile 460	Lys	Ala	Gly	Thr
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			580				Ser	585					590		
_		595					Asn 600					605			
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				645			Gln		650					655	
			660				Asp	665					670		
		675					Ile 680					685			
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705					710		Leu			715					720
				725			Arg		730					735	
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Ala 785		Gly	Thr	Met	. Phe 790		Arg	Arg	GTĀ	795		TTE	туг	Pro	Asn 800



2450

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2451 40 Thr Asp Asp Thr Ser Pro Thr Tyr Lys Val Leu Glu Glu Gly Ala Asn 55 Thr Leu Ser Lys Glu Glu Thr Thr Arg Leu Ala Gln Arg Gln Leu Lys Phe Ile Gln Gly Leu Gln Ala Ala Leu Val Arg Ile Glu Asn Lys Thr 90 Tyr Gly Ile Cys Arg Glu Thr Gly Lys Leu Ile Pro Ala Glu Arg Leu 105 Arg Ala Val Pro His Ala Thr Leu Ser Ile Glu Ala Lys Asn Ser Gly 120 Lys Lys 130 <210> 5710 <211> 253 <212> PRT <213> B.fragilis <400> 5710 Met Ser Ile Leu Ser Lys Asn Arg Ile Lys Tyr Ile Arg Ser Leu Glu 10 Leu Lys Lys Ile Arg Lys Glu Glu Lys Val Phe Leu Ala Glu Gly Pro Lys Leu Val Gly Asp Val Leu Gly Tyr Phe Pro Cys Lys Leu Leu Ile Ala Thr Ser Asp Trp Leu Glu Glu His Pro Ala Val Gln Ala Ala Glu 55 60 Val Ile Glu Val Thr Ser Glu Glu Leu Ser Arg Thr Ser Leu Leu Lys 70 75 Thr Pro Gln Gln Val Leu Ala Leu Phe Glu Gln Pro Glu Tyr Glu Ile 90 85 Asp Met Glu Ala Ile Arg Asn Ser Leu Cys Leu Ala Leu Asp Asn Ile 105 Gln Asp Pro Gly Asn Leu Gly Thr Ile Ile Arg Leu Ala Asp Trp Phe 120 Gly Ile Glu His Ile Phe Cys Ser Pro Asn Thr Val Asp Val Phe Asn 140 135 Pro Lys Thr Ile Gln Ala Thr Met Gly Gly Ile Ala Arg Val Lys Val 155 150 Tyr Tyr Thr Ala Leu Pro Asp Leu Met His Ser Leu Gly Asn Val Pro 170 165 Val Tyr Gly Thr Leu Leu Asp Gly Glu Asn Met Tyr Glu Gln Pro Leu 180 185 Ser Lys Asn Gly Ile Ile Ile Met Gly Asn Glu Gly Asn Gly Ile Ser 200 205 Pro Glu Ile Glu Lys Leu Val Asn Arg Lys Leu Tyr Ile Pro Asn Tyr 220 215 Pro Ala Glu Arg Glu Thr Ser Glu Ser Leu Asn Val Ala Ile Ala Thr 235 230 Ala Ile Val Cys Ala Glu Phe Arg Arg Gln Ala Ala Leu 250 245 <210> 5711 <211> 343 <212> PRT <213> B.fragilis

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<213> B.fragilis

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Asn Ile Ser Phe Asn Pro Arg Leu Val Leu Thr Gly Val Met Gln Val

1 5 10 15

Arg Phe Val Lys Lys Leu Phe Pro Leu Lys Ile Phe Phe Arg Ile Ile
20 25 30

Ser Asn Asp Leu Leu Tyr Trp Leu Lys Glu Ile Gly Trp Gly Cys His
35 40 45

Ile Ile Gly Tyr Leu Lys Gly Val Thr Thr Asp Val Gln Phe Val Lys
50 60

Pro Phe Arg Leu 65 <210> 5713 <211> 66 <212> PRT <213> B.fragilis <400> 5713 Ile Leu Thr Ser Lys Lys Met His Cys Phe Lys Lys Ala Met His Phe Leu Ser Val Leu Gln Lys Lys Tyr Asn Val Ser Ile Phe Leu Ile Ser 25 Asp Leu Leu Tyr Gln Gln Tyr Lys Lys Ser Asn Tyr Gly Leu Ser Ile 40 Phe Leu Ser Ile Leu Phe Val His Tyr Met Asp Ile Tyr Arg Lys Lys 55 Tyr Thr 65 <210> 5714 <211> 413 <212> PRT <213> B.fragilis <400> 5714 Met Asn Asn Ser Pro Gln Pro Ala Ala Lys Gly Phe Thr Arg Ala Phe 10 Tyr Val Ser Asn Thr Val Glu Leu Phe Glu Arg Met Ala Tyr Tyr Ala 25 Val Phe Ile Val Leu Thr Ile Tyr Leu Ser Thr Ile Leu Gly Phe Asn 40 Asp Phe Glu Ala Ser Met Ile Ser Gly Leu Phe Ser Gly Gly Leu Tyr 60 55 Leu Leu Pro Ile Phe Thr Gly Ala Tyr Ala Asp Lys Ile Gly Phe Arg 70 Lys Ser Met Leu Val Ala Phe Ser Leu Leu Thr Ala Gly Tyr Phe Gly 90 85 Leu Gly Val Leu Pro Thr Leu Leu Glu Ser Thr Gly Leu Val Ser Tyr 105 Gly Ala Ser Thr His Phe Ser Gly Leu Thr Asp Ser Val Phe Arg Trp 120 125 Leu Ile Val Pro Val Leu Phe Ile Ile Met Ile Gly Gly Ser Phe Ile 135 Lys Ser Val Ile Ser Ala Ser Val Ala Lys Glu Thr Thr Glu Ala Thr 155 150 Arg Ala Arg Gly Tyr Ser Ile Phe Tyr Met Met Val Asn Ile Gly Ala 165 170 Phe Thr Gly Lys Thr Val Ile Asp Pro Leu Arg Asn Met Ile Gly Asp 190 180 185 Gln Ala Tyr Ile Tyr Ile Asn Tyr Phe Ser Gly Phe Met Thr Leu Ile 205 Ala Leu Leu Ala Val Phe Phe Leu Tyr Lys Ser Thr His Thr Val Gly 220 215 Glu Gly Lys Ser Met Arg Glu Ile Gly Gln Gly Phe Leu Arg Ile Val 235 230 Thr Asn Trp Arg Leu Leu Ile Leu Ile Leu Ile Ile Thr Gly Phe Trp 250 Met Val Gln His Gln Leu Tyr Ala Thr Met Pro Lys Tyr Val Ile Arg

270 265 Met Ala Gly Glu Thr Ala Lys Pro Gly Trp Ile Ala Asn Val Asn Pro 280 275 Phe Val Val Cys Cys Val Ser Phe Val Thr Arg Trp Met Ala Lys 300 295 Arg Ser Ala Ile Thr Ser Met Asn Ile Gly Met Phe Leu Ile Pro Val 315 310 Ser Ala Leu Leu Met Ala Cys Gly Asn Leu Leu Asp Asn Glu Val Val 330 Ser Gly Met Ser Asn Ile Thr Leu Met Met Ile Val Gly Ile Val Val 345 340 Gln Gly Leu Ala Glu Cys Phe Ile Ser Pro Arg Tyr Leu Glu Tyr Phe 360 365 Ser Leu Gln Ala Pro Lys Gly Glu Glu Gly Met Tyr Leu Gly Phe Lys 380 375 Ser Ser Ser Phe Phe Phe Ile Phe His Phe Arg Ile Trp Ser Cys Arg 395 390 Arg Ser Ala Asp Gln Val Leu Ser Gly Ser Asn Phe Val 405 410

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<400> 5715

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265
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Asn Ala Asp Glu Asn Arg Val Lys Ile Gln Arg Ile Glu Met Asp Leu
                            280
                                               285
Phe Glu Glu Ser Leu Glu Arg Ile Lys Arg Met Val Arg Pro Asn Cys
                                            300
                        295
Ile His Val Gly Tyr Gln Tyr Gly Leu Ala Arg Tyr Leu Gly Phe Cys
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                                        315
Ala Asn Lys Lys Phe Pro Leu Leu
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Ser Thr Val Val Gly Thr Met Arg Leu Gly Cys Thr Ser Ser Ala Ser
Leu Phe Lys Arg Ser Ser Gly Thr Val Ile Thr Pro Thr Phe Gly Ser
                        55
Ile Val Gln Lys Gly Lys Phe Ala Ala Cys Ala Phe Ala Leu Asp Arg
                                        75
                    70
Gln Leu Lys Ser Val Asp Leu Pro Thr Phe Gly Ser Pro Thr Ile Pro
                85
His Cys Asn Ala Ile Ile Leu
            100
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Asn Cys Phe Leu Leu Arg Ile Ile Leu Lys Arg Ile Ile Tyr Lys Lys
                                25
Asp Leu Asp Met Met Lys Pro Ile Ala Val Asn Gln Leu Ser Asp Asn
                            40
Phe Phe Glu Thr Ile Ser Lys Glu Trp Met Leu Val Thr Ala Gly Asn
                        55
Lys Asp Ala Phe Asn Thr Met Thr Ala Asn Trp Gly Gly Ile Gly Phe
                    70
                                        75
Leu Trp Asn Lys Pro Val Val Tyr Val Phe Ile Arg Pro Glu Arg Tyr
                85
                                    90
Thr Phe Gly Phe Met Glu Lys Asn Asp Tyr Phe Thr Leu Ser Phe Leu
                                105
Gly Glu Glu Asn Lys Ser Ile His Lys Ile Cys Gly Ser Lys Ser Gly
                            120
Arg Glu Val Asp Lys Ile Lys Glu Thr Gly Leu Lys Pro Met Ile Thr
                                            140
                        135
Asp Lys Gly Asn Val Leu Phe Glu Gln Gly Arg Leu Ser Leu Glu Cys
                    150
                                        155
Arg Lys Leu Tyr Thr Asp Val Leu Arg Lys Glu Asn Phe Leu Asp Pro
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170

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Ser Val Tyr Glu Gln Trp Tyr Thr Thr His Gly Gly Leu His His Val
180 185 190

Tyr Val Ala Glu Ile Thr Ser Ala Trp Ile Lys Asp
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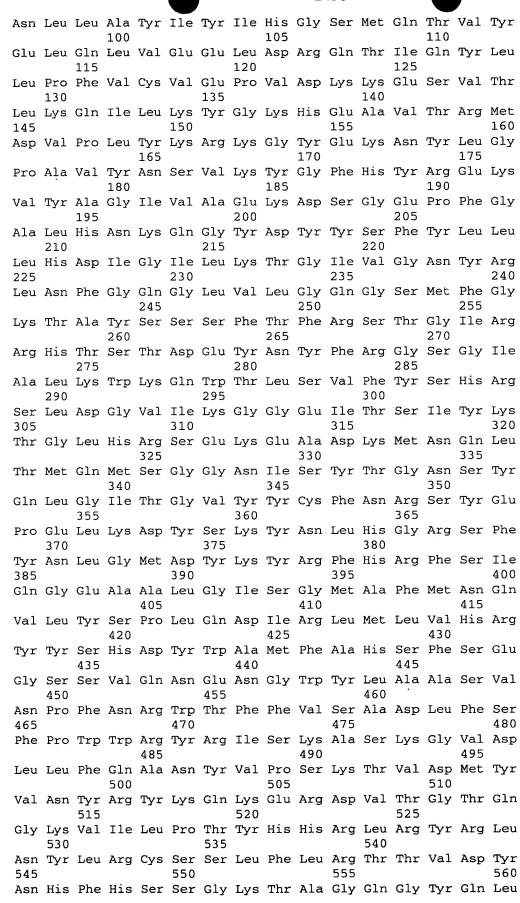
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Glu Ser Ile Ile Asn Glu Val Leu Glu Tyr Leu Met Glu Leu Asn Lys



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                                265
Asn Glu Tyr Pro Glu Leu Ala Ala Ala Tyr Gly Asp Leu Cys Lys Leu
                           280
                                               285
Tyr Glu Lys Gln Leu Leu Thr Lys Cys Glu Val Leu Thr Leu Phe Gln
                        295
Thr Leu Phe Ser Lys Asn Glu Lys Lys Leu Asn Leu
                    310
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Arg His Ile Thr Asp Lys Arg Asn Tyr Gln Ser Lys Ile Asn Gln Ile
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Met Thr Lys Ser Ile Lys Gly Thr Gln Thr Glu Lys Asn Leu Leu Thr
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Ser Phe Ala Gly Glu Ser Gln Ala Arg Met Arg Tyr Thr Tyr Phe Ala
Ser Val Ala Lys Lys Glu Gly Tyr Glu Gln Ile Ala Ala Ile Phe Thr
Glu Thr Ala Asp Gln Glu Lys Glu His Ala Lys Arg Met Phe Lys Phe
Leu Glu Gly Gly Met Val Glu Ile Thr Ala Ser Tyr Pro Ala Gly Val
                                    90
                85
Ile Gly Asn Thr Leu Gln Asn Leu Gln Ala Ala Ala Gly Glu His
                                105
Glu Glu Trp Ser Leu Asp Tyr Pro His Phe Ala Asp Val Ala Glu Gln
                            120
                                               125
Glu Gly Phe Pro Met Ile Ala Ala Met Tyr Arg Asn Ile Ser Ile Ala
                        135
                                            140
Glu Lys Gly His Glu Glu Arg Tyr Leu Ala Phe Val Lys Asn Ile Glu
                    150
                                        155
Val Ala Ser Val Phe Ala Lys Glu Gly Glu Val Val Trp Gln Cys Arg
                                    170
Asn Cys Gly Tyr Ile Glu Val Gly Lys Glu Ala Pro Glu Val Cys Pro
                                185
Ala Cys Leu His Pro Gln Ala Tyr Phe Glu Ile Lys Lys Glu Asn Tyr
                            200
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Ile Phe Leu Leu Val Asn Met Thr Leu Ile Thr Ser Thr Cys His Ala
                                25
Gln Asn Arg Ser Asp Tyr Pro Trp Glu Glu Val Met Glu Asn Leu Ser
Ile Ser Asp Glu Glu Gly Asp Ile Arg Asn Trp Glu Asn Glu Leu Glu
                        55
                                            60
Glu Leu Thr Asp Leu Val Asn Asn Pro Val Asn Ile Asn Ser Ala Thr
Lys Glu Gln Leu Gln Arg Phe Pro Phe Leu Asn Asp Val Gln Ile Glu
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565 570 575

Thr Gln Thr Ala Gly Trp Lys Leu Pro Trp Leu Pro Leu Thr Ala Glu
580 585 590

Leu Gln Gly Ser Tyr Phe His Thr Asp Asp Tyr Asp Ser Arg Ile Tyr
595 600 605

Ile Tyr Glu Lys Gly Leu Leu Tyr Ser Phe Tyr Thr Pro Ser Phe Gln
610 620

Gly Glu Gly Ile Arg Leu Ala Ile Tyr Phe Arg Tyr Asp Met Asn Lys
625 630 635 640

His Trp Thr Ala Ile Ala Lys Leu Gly Gln Thr Thr Tyr Phe Asp Arg 645 650 655

Asp Glu Ile Gly Ser Gly Asn Asp Leu Ile Arg Gly Asn Lys Lys Thr 660 665 670

Asp Val Gln Met Gln Leu Arg Leu Lys Phe 675 680

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<212> PRT

<213> B.fragilis

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Asn Ser Thr Thr Met Lys Lys Leu Thr Arg Lys Ser Leu Asn Glu Leu 1 5 10 15

Ala Lys Thr Met Pro Ile Ile Glu Glu Ser Leu Gln Met Ser Tyr Val 20 25 30

Gly Gly Gly Asn Gly Thr Ser Ala Asn Pro Tyr Thr Gln Glu Glu Tyr 35 40 45

Glu Ser Met Val Ser Ser Gly Ile Trp Asn Gly Gly Tyr Val Glu Asn 50 55 60 Trp Gly Tyr Thr Phe Pro Glu Met Ala Val Ser Ser Tyr Asp Pro Asn

65  $\phantom{0}70$   $\phantom{0}75$   $\phantom{0}80$  Asn Leu Pro Lys Thr Gly Val Asp Ser Tyr Asp Leu Met Tyr Gln Gly

85 90 95 Gly Phe Ala Ile Gly Tyr Lys Ala Gly Leu Ser Gly Ser Thr Leu Asp 100 105 110

Asp Ile Gly Ile Gly Ala Trp Ser Ala Leu Ala Val Ile Ser Ala Gly
115 120 125

Ser Glu Ile Gly Gly Val Asn Ser Asp Met Ile Trp Tyr Ser Lys Gly 130 135 140

Leu Arg Asp Gly Leu Thr Lys Gly Arg Gly Ala Arg Gly Asn 145 150 155

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<400> 5723

Leu Trp Arg Thr Val Glu Asn Lys Ser Thr Met Asp Asp Ile Val Lys
1 10 15

Val Leu Val Ile Met Ala Ala Phe Ala Leu Pro Leu Ile Arg Gln Ile
20 25 30

Lys Lys Ser Lys Thr Glu Arg Ser Ala Gln Lys Pro Phe Val Pro Ile 35 40 45

Pro Asp Thr Glu Glu Pro Glu Val Leu Lys Val Thr Arg Lys Tyr Gln 50 55 60

Pro Leu His Ser Gln Ser Thr Ser Gln Lys Val Glu Val Lys Lys Asn 65 70 75 80

2460
s Ile Glu Thr Thr Pro Ala Asn Asp Pro G

Lys Thr Val Ser Gln Lys Ile Glu Thr Thr Pro Ala Asn Asp Pro Glu

85

90

95

Pho Thr Ile His Ser Ala Clu Clu Ala Arg Lys Ala Ile Ile Trp Ser

Phe Thr Ile His Ser Ala Glu Glu Ala Arg Lys Ala Ile Ile Trp Ser 100 105 110

Glu Ile Leu Asn Arg Lys Tyr 115

<210> 5724

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<212> PRT

<213> B.fragilis

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Val Asn Ala Ala Arg Lys Thr Ile Asn Ile Asn Leu Ile Leu Tyr Phe 1 5 10 15

Cys Lys Met Asn Met Arg Leu Thr Ile Gly Leu Leu Met Leu Ser Ile 20 25 30

Ala Leu Leu Phe Ser Ser Glu Ser Leu Ala Gln Glu Lys Thr Asn Leu 35 40 45

Gly Gly Tyr Leu Val Pro Met Cys Val Tyr Asn Gly Asp Thr Ile Pro 50 55 60

Ala Phe Gln Ile Pro Thr Ile His Ile Phe Lys Pro Leu Lys Phe Arg
65 70 75 80

Asn Arg Lys Glu Gln Met Glu Tyr Tyr Lys Leu Val Arg Asn Val Lys 85 90 95

Lys Val Tyr Pro Ile Ala Arg Glu Ile Asn Arg Thr Ile Ile Glu Thr 100 105 110

Tyr Glu Tyr Leu Gln Thr Leu Pro Asn Glu Lys Ala Arg Gln Arg His 115 120 125

Ile Lys Arg Val Glu Lys Gly Leu Lys Glu Gln Tyr Thr Pro Arg Met 130  $$135\$ 

Lys Lys Leu Ser Phe Ala Gln Gly Lys Leu Leu Ile Lys Leu Ile Asp 145 150 155 160

Arg Gln Ser His Gln Ser Ser Tyr Glu Leu Val Lys Ala Phe Met Gly 165 170 175

Pro Phe Lys Ala Gly Phe Tyr Gln Thr Phe Ala Ala Leu Phe Gly Ala 180 185 190

Ser Leu Lys Lys Gln Tyr Asp Pro Glu Gly Glu Asp Lys Leu Thr Glu 195 200 205

Arg Val Ile Leu Leu Val Glu Ser Gly Gln Leu 210 215

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His Cys Tyr Leu Ile Pro Thr His Lys Met Ile Ser Lys Pro Thr Lys 1 5 10 15

Ser Asp Val Met Arg Glu Leu Arg Asp Tyr Ile Phe Ile Thr Leu Gly

Leu Ile Ser Tyr Ala Leu Gly Trp Thr Ala Phe Leu Ile Pro Tyr Gln 35 40 45

Ile Thr Thr Gly Gly Thr Thr Gly Ile Gly Ala Ile Ile Tyr Tyr Ala 50 55 60

Thr Gly Phe Pro Ile Gln Trp Ser Tyr Phe Ile Ile Asn Ala Val Leu 65 70 75 80

Met Thr Phe Ala Ile Lys Ile Leu Gly Pro Lys Phe Ser Ile Lys Thr

90 Thr Tyr Ala Ile Phe Met Leu Thr Phe Phe Leu Trp Phe Phe Gln Leu 100 105 Ile Ile Val Asp Asp Lys Gly Ala Pro Leu Gln Leu Val Gly Glu Gly 120 Gln Asp Phe Met Ala Cys Ile Ile Gly Ala Ile Met Cys Gly Leu Gly 135 Leu Gly Val Val Phe Asn Asn Gly Ser Thr Gly Gly Thr Asp Ile 150 155 Ile Ala Ala Ile Val Asn Lys Tyr Lys Asp Val Thr Leu Gly Arg Met 165 170 Ile Met Phe Cys Asp Ile Ile Ile Ser Ser Cys Tyr Phe Ile Phe 185 Asn Asp Trp Arg Arg Val Ile Phe Gly Phe Val Thr Leu Phe Ile Ile 200 205 Gly Phe Val Leu Asp Tyr Val Val Asn Ser Ala Arg Gln Ser Val Gln 215 220 Phe Phe Ile Phe Ser Lys Asp Tyr Ala Lys Ile Ala Asp Arg Ile Thr 230 235 Lys Glu Thr His Arg Gly Val Thr Val Leu Asp Gly Leu Gly Trp Tyr 250 Ser Gln Asn Asn Val Lys Val Leu Val Val Leu Ala Tyr Lys Arg Gln 260 265 Ser Leu Asp Ile Phe Arg Leu Val Lys Asp Ile Asp Pro Asn Ala Phe 280 Ile Ser Gln Ser Ser Val Ile Gly Val Tyr Gly Glu Gly Phe Asp Arg 295 300 Leu Lys Ile Lys <210> 5726 <211> 75 <212> PRT <213> B.fragilis <400> 5726 Glu Leu Ile Ala Leu Ser Ile Phe Asp Cys Gln Glu Lys Leu Val Phe 10 Ala Thr Gln Ser Tyr Asp Arg Ala Asp Ser Arg Met Glu Gly Ala Thr Glu Gln Asp Cys Ala Lys Lys Arg Thr Asp Ala Asn Asn Ile Lys Tyr 40 Phe Ile Thr Gly Val Phe Ile Asn Phe Leu Ser Ala Ser Val Ser Pro 55 Leu Phe Pro Val Phe Val Leu Phe Ser Leu <210> 5727 <211> 145 <212> PRT <213> B.fragilis <400> 5727 Phe Ile Asn Leu Leu Thr Phe Arg Gln Lys Ser Asp Lys Met Asn Arg 10

Ile Phe His Ala Arg Ile Val Trp Tyr Gln Tyr Phe Leu Leu Val Val 20 25 30

Leu Gly Val Asn Ala Phe Gly Phe Leu Trp Cys Lys Asn Ile Ile Leu 35 40 45

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Ala Thr Leu Met Met Leu Phe Leu Ile Val Val Ile Glu Gln Ile Ile
                                           60
                       55
His Thr Val Tyr Thr Val Thr Ala Asp Gly Leu Leu Leu Asn His
Gly Arg Phe Ile Arg Lys Lys Thr Ile Pro Ile Ala Glu Ile Thr Ser
                                   90
                85
Ile Arg Lys Val His Ser Met Lys Phe Gly Ser Phe Ser Val Thr Asn
Tyr Leu Leu Ile Glu Tyr Gly Lys Gly Lys Tyr Ala Ser Val Leu Pro
                           120
Val Lys Glu Lys Glu Phe Met Glu Leu Ile Glu Lys Thr Arg Asn Leu
                       135
Ile
145
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Phe Ser Lys Tyr Met Leu Ile Leu Leu Thr Gly Phe Lys Pro Leu Ser
Thr Pro Met Leu Thr Arg Lys Glu Leu Leu Gln His Thr Asn Arg
                                2.5
Asn Asp Ile Ile Met Arg Lys Leu Lys Ile Thr Glu Leu Asn Arg Ile
                           40
Ser Ile Glu Glu Phe Lys Glu Ala Asp Lys Leu Pro Leu Val Val Val
                        55
Leu Asp Asp Ile Arg Ser Leu His Asn Ile Gly Ser Val Phe Arg Thr
                   70
                                       75
Ala Asp Ala Phe Arg Ile Glu Cys Ile Tyr Leu Cys Gly Ile Thr Ala
                85
                                    90
Thr Pro Pro His Pro Glu Met His Lys Thr Ala Leu Gly Ala Glu Phe
           100
                               105
Thr Val Asp Trp Lys Tyr Val Asn Asn Ala Val Glu Thr Val Asp Asn
                           120
Leu Arg Ser Glu Gly Tyr Val Val Tyr Ser Val Glu Gln Ala Glu Gly
                        135
Ser Ile Met Leu Asp Glu Leu Thr Leu Asp Arg Ser Lys Lys Tyr Ala
                    150
                                        155
Val Val Met Gly Asn Glu Val Lys Gly Val Gln Gln Glu Val Ile Asp
               165
                                   170
His Ser Asp Gly Cys Ile Glu Ile Pro Gln Tyr Gly Thr Lys His Ser
                               185
Leu Asn Val Ser Val Thr Ala Gly Ile Val Ile Trp Asp Leu Phe Lys
       195
                            200
Lys Leu Lys
    210
<210> 5729
<211> 448
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Thr Met Lys Tyr Gln Val Ile Ile Ile Gly Gly Pro Ala Gly Tyr
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Thr Ala Ala Glu Ala Ala Gly Lys Ala Gly Leu Ser Val Leu Leu Phe

25 20 Glu Lys Gln Asn Leu Gly Gly Val Cys Leu Asn Glu Gly Cys Ile Pro 40 Thr Lys Thr Leu Leu Tyr Ser Ala Lys Thr Tyr Asp Gly Ala Lys His 55 60 Ala Ser Lys Tyr Ala Val Thr Val Pro Glu Val Phe Phe Asp Leu Pro Lys Ile Ile Ala Arg Lys Ser Lys Val Val Arg Lys Leu Val Leu Gly 90 Val Lys Ser Lys Leu Thr Ser Asn Asn Val Thr Ile Ile Ser Gly Glu 105 Ala Thr Ile Leu Asp Lys Asn Thr Val Arg Cys Gly Glu Glu Thr Tyr 125 120 Glu Cys Asp Asn Leu Ile Leu Cys Thr Gly Ser Glu Thr Phe Ile Pro 135 140 Pro Ile Ser Gly Ile Asp Ser Val Asn Tyr Trp Thr His Arg Glu Ala 155 150 Leu Asp Asn Lys Glu Leu Pro Ala Ser Leu Ala Ile Val Gly Gly Gly 170 165 Val Ile Gly Met Glu Phe Ala Ser Phe Phe Asn Ser Leu Gly Val Lys 180 185 Val Thr Val Ile Glu Met Met Asp Glu Ile Leu Gly Gly Met Asp Lys 200 Glu Leu Ser Ala Leu Leu Arg Ala Asp Tyr Ala Lys Arg Gly Ile Gln 220 215 Phe Leu Leu Ser Thr Lys Val Val Ser Leu Ala Gln Thr Glu Gly 235 230 Ala Val Val Ser Tyr Glu Asn Ala Glu Gly Ala Gly Ser Val Ile Ala 245 250 Glu Lys Leu Leu Met Ser Val Gly Arg Arg Pro Val Thr Lys Gly Phe 265 Gly Leu Glu Asn Leu Asn Leu Gln Arg Thr Glu Arg Gly Ser Ile Val 280 285 Val Asn Gly Gln Met Glu Ser Ser Leu Pro Gly Val Tyr Val Cys Gly 295 300 Asp Leu Thr Gly Phe Ser Leu Leu Ala His Thr Ala Val Arg Glu Ala 315 310 Glu Val Ala Val His Ala Ile Leu Gly Lys Glu Asp Arg Met Ser Tyr 330 325 Ala Ala Ile Pro Gly Val Val Tyr Thr Asn Pro Glu Ile Ala Gly Val 345 Gly Gln Thr Glu Glu Ser Leu Thr Ala Lys Gly Ile Ala Tyr Arg Ala 360 Val Lys Leu Pro Met Ala Tyr Ser Gly Arg Phe Val Ala Glu Asn Glu 380 375 Gly Val Asn Gly Val Cys Lys Val Leu Leu Gly Glu Asp Asp Thr Ile 395 390 Leu Gly Ala His Val Leu Gly Asn Pro Ala Ser Glu Ile Ile Thr Leu 405 410 Ala Gly Met Ala Val Glu Met Lys Leu Lys Ala Ala Glu Trp Lys Lys 425 Ile Val Phe Pro His Pro Thr Val Ala Glu Ile Phe Arg Glu Ala Leu 435 440

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<400> 5731

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145

<213> B.fragilis <400> 5732 Gln Ala Thr His Lys Ile Ser Ile Asn Met Glu Ser Thr Asn Arg Leu Arg Tyr Leu Ile Ala Gly Thr Gly Gly Val Gly Gly Ser Ile Ala Gly 25 Phe Leu Ser Leu Ala Gly Lys Asp Ile Thr Cys Ile Ala Arg Gly Ala 40 His Leu Gln Ala Ile Gln Gln Asp Gly Leu Lys Leu Lys Ser Asp Leu 55 Lys Gly Glu His Ala Leu Arg Ile Asn Ala Cys Thr Ala Glu Glu Tyr Asn Gly Lys Ala Asp Val Ile Phe Val Cys Val Lys Gly Tyr Ser Val 85 90 Asp Ser Ile Thr Glu Leu Ile Lys Arg Ala Ala His Asp Arg Thr Ile 105 Val Ile Pro Ile Leu Asn Val Tyr Gly Thr Gly Pro Arg Ile Gln Arg 120 Leu Val Pro Gly Val Thr Val Leu Asp Gly Cys Ile Tyr Ile Val Gly 140 Phe Val Ser Gly Pro Gly Glu Ile Thr Gln Met Gly Thr Ile Phe Arg

155

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2465
Leu Val Tyr Gly Ala His Arg Gly Ile Leu Val Pro Ala Gly Leu Met
                                   170
               165
Glu Ala Val Gln Arg Asp Leu Gln Glu Ser Gly Ile Lys Val Glu Ile
                               185
Ser Pro Asp Ile Asn Arg Asp Thr Phe Ile Lys Trp Ser Phe Ile Ser
                           200
Ala Met Ala Val Thr Gly Ala Tyr Phe Asp Val Pro Met Gly Glu Val
Gln Lys Pro Gly Lys Val Arg Asp Thr Phe Ile Gly Leu Ser Thr Glu
                   230
                                       235
Ser Ala Ala Leu Gly Lys Lys Leu Gly Ile Glu Phe Lys Glu Asp Ile
                                   250
Val Thr Tyr Asn Leu Lys Val Ile Asp Lys Leu Ala Pro Glu Ser Thr
                               265
           260
Ala Ser Met Gln Lys Asp Ile Ala Arg Gly His Glu Ser Glu Val Gln
                           280
Gly Leu Leu Phe Asp Met Ile Thr Ala Ala Glu Glu Gln Gly Ile Asp
                      295
                                           300
Val Pro Thr Tyr Arg Glu Val Ala Lys Lys Phe Ile Lys Gln
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Asn Lys Leu His Thr Met Lys Arg Lys Leu Val Phe Ala Thr Asn Asn
                                   1.0
Ala His Lys Leu Glu Glu Val Ser Ala Ile Leu Gly Asp Lys Val Glu
                               2.5
Leu Leu Ser Leu Asn Asp Ile Asn Cys His Thr Asp Ile Pro Glu Thr
                           40
Ala Glu Thr Leu Glu Gly Asn Ala Tyr Leu Lys Ser Ser Phe Ile Tyr
                       55
Arg Asn Tyr Gly Leu Asn Cys Phe Ala Asp Asp Thr Gly Leu Glu Val
Glu Ser Leu Gly Gly Ala Pro Gly Ile Tyr Ser Ala Arg Tyr Ala Gly
                                    90
Gly Glu Gly His Asn Ala Glu Ala Asn Met Leu Lys Leu Leu His Glu
                               105
Leu Glu Gly Lys Asp Asn Arg Arg Ala Gln Phe Arg Thr Ala Ile Ser
                           120
                                               125
Leu Ile Leu Asp Glu Lys Glu Tyr Leu Phe Glu Gly Ile Ile Lys Gly
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180 Cys Glu Phe Leu Arg Ser Ile

165

135

150

Glu Ile Ile Lys Glu Lys Arg Gly Asp Ser Gly Phe Gly Tyr Asp Pro

Val Phe Val Pro Glu Gly Tyr Asp Arg Thr Phe Ala Glu Leu Gly Asn

Glu Ile Lys Asn Gln Ile Ser His Arg Ala Leu Ala Val Asn Lys Leu

185

155

170

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<211> 493

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a Lau Thin Agn

Ser Tyr Glu Ser Phe Phe Thr Leu Arg Asn Leu Ala Leu Tyr Asp Phe 465

Lys Lys Asn Val Glu Leu Glu Lys Ile Leu Phe Asn Asp 480

485

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<211> 192

<212> PRT

<213> B.fragilis

<400> 5735

Phe Ile Tyr Lys Pro Leu Ile Ile Thr Ala Met Lys Lys Leu Thr Lys
1 10 15

Lys Asn Leu Ser Glu Leu Ala Lys Thr Met Pro Val Ile Glu Glu Ser 20 25 30

Leu Gln Met Ser Tyr Val Gly Gly Gly Asn Gly Thr Ser Ala Asn Pro 35 40 45

Tyr Thr Lys Val Glu Phe Asp Ser Met Leu Ser Asn Asp Asn Trp Asn 50 55 60

Gly Gly Tyr Val Glu Gly Met Gly Tyr Val Ala Pro Asn Thr Tyr Ile 65 70 75 80

Tyr Gly Asn Ser Val Tyr Trp Gly Ser Val Ser Gln Asp Tyr Tyr Thr 85 90 95

Phe Pro Asp Tyr Val Thr Ser Leu Ser Ser Asp Gly Leu Asn Gln Met 100 105 110

Ala Glu Ser Leu Ala Gly Ala Ile Pro Gly Val Gly Ser Tyr Thr Ala 115 120 125

Tyr Leu Ser Gln Glu Leu Gly Asp Met Ser Arg Glu Ile Gln Ser Glu 130 135 140

Thr Tyr Met Gly Ser Ser Val Lys Phe Ser Val Tyr Asn Ala Asn Asn 165 170 175

Gly Glu Leu Ile Thr Ser Lys Thr Ile Asn Met Phe Gly Phe Trp Gln 180 185 190

<210> 5736

<211> 506

<212> PRT

<213> B.fragilis

<400> 5736

His Glu Asn Asn Thr Ile Ile Met Ala Phe Lys Ser Ile Ser Ala Ala 1 5 10 15

Glu Ala Ala Ser Leu Val Lys His Gly Tyr Asn Ile Gly Leu Ser Gly 20 25 30

Phe Thr Pro Ala Gly Thr Ala Lys Ala Val Thr Ser Glu Ile Ala Lys 35 40 45

Ile Ala Glu Ala Glu His Ala Lys Gly Asn Pro Phe Gln Ile Gly Ile

Phe Thr Gly Ala Ser Thr Gly Asp Ser Cys Asp Gly Ile Leu Ser Arg 65 70 75 80

Val Lys Ala Ile Arg Tyr Arg Ala Pro Tyr Thr Thr Asn Pro Asp Phe
85 90 95

Arg Lys Ala Val Asn Asn Gly Glu Ile Ala Tyr Asn Asp Ile His Leu
100 105 110

Ser Gln Met Ala Gln Glu Val Arg Tyr Gly Phe Met Gly Lys Val Asn 115 120 125

Val Ala Ile Ile Glu Ala Cys Glu Val Thr Pro Asp Gly Lys Ile Tyr

135 140 Leu Thr Ala Ala Gly Gly Ile Ala Pro Thr Val Cys Arg Leu Ala Asp 155 150 Gln Ile Ile Val Glu Leu Asn Ser Ala His Ser Lys Asn Met Met Gly 165 170 Met His Asp Val Tyr Glu Pro Leu Asp Pro Pro Tyr Arg Arg Glu Ile 185 Pro Ile Tyr Lys Pro Ser Asp Arg Ile Gly Leu Pro Tyr Ile Gln Val 200 195 Asp Pro Lys Lys Ile Val Gly Ile Val Glu Thr Asn Trp Pro Asp Glu 220 215 Ala Arg Ser Phe Ala Ala Ala Asp Pro Ile Thr Asp Lys Ile Gly Gln 230 235 Asn Val Ala Asp Phe Leu Ala Ala Asp Met Lys Arg Gly Ile Ile Pro 250 245 Ser Thr Phe Leu Pro Leu Gln Ser Gly Val Gly Asn Ile Ala Asn Ala 260 265 270 Val Leu Gly Ala Leu Gly Arg Asp Gln Thr Ile Pro Ala Phe Glu Met 275 280 285 Tyr Thr Glu Val Ile Gln Asn Ser Val Ile Gly Leu Ile Arg Glu Gly 295 Arg Val Lys Phe Gly Ser Ala Cys Ser Leu Thr Val Thr Asn Asp Cys 310 315 Leu Gln Gly Ile Tyr Asp Asp Met Asp Phe Phe Arg Asp Lys Leu Ile 325 330 Leu Arg Pro Ser Glu Ile Ser Asn Ser Pro Glu Val Val Arg Arg Leu 340 345 Gly Ile Ile Ser Ile Asn Thr Ala Ile Glu Ala Asp Ile Tyr Gly Asn 360 Val Asn Ser Thr His Ile Gly Gly Thr Lys Met Met Asn Gly Ile Gly 375 380 Gly Ser Gly Asp Phe Thr Arg Asn Ala Tyr Ile Ser Ile Phe Thr Cys 390 395 Pro Ser Val Ala Lys Glu Gly Lys Ile Ser Ser Ile Val Pro Met Val 405 410 Ser His Leu Asp His Ser Glu His Ser Val Asn Ile Val Ile Thr Glu 425 Gln Gly Val Ala Asp Leu Arg Gly Lys Ser Pro Lys Glu Arg Ala Gln 445 440 Ala Ile Ile Glu Asn Cys Ala His Pro Asp Tyr Lys Gln Ile Leu Trp 455 Asp Tyr Leu Lys Leu Ala Gly Asn Lys Ser Gln Thr Pro His Ala Ile 475 470 Gln Ala Ala Leu Gly Met His Ala Glu Leu Ala Lys Ser Gly Asp Met 490 485 Lys Asn Val Asn Trp Ala Glu Tyr Glu Arg 500

<210> 5737

<211> 148

<212> PRT

<213> B.fragilis

<400> 5737

 Ser Cys
 Tyr Asn Glu Val Leu Tyr Lys
 Ser Ile Arg Lys
 Thr Asn Ser

 1
 5
 10
 15

 Lys Lys Asn Arg Ser Gln Tyr Met Asn Ile Ala Phe Leu Thr Thr Leu 20
 25
 30

 Asn Pro Ala Asp Ile Asn Asn Trp Ser Gly Thr Thr Phe His Leu Phe

40 His Ala Leu Ser Arg Lys His His Val Lys Val Ile Gly Gln Asn Thr 55 Leu Pro Gln Ala Ala Tyr Phe Thr Lys Asp Asn Cys Ile Lys Lys Asn 70 75 Pro Leu Glu Asn Tyr Val Ser Val Phe Gly Lys Leu Cys Thr Glu Gln 90 Leu Thr Asn Tyr Asp Leu Val Phe Phe Gly Asp Leu Tyr Leu Ala Pro 105 Phe Leu Asp Val Asn Val Pro Val Val His Leu Ser Asp Val Thr Tyr 120 His Ser Phe Gln Ser Tyr Leu Asn Pro Leu Lys Asn Glu Glu Arg Tyr 135 Arg Lys Leu Glu 145 <210> 5738 <211> 457 <212> PRT <213> B.fragilis <400> 5738 Arg Thr Gly Lys Lys Met Asn Ser Arg Ile Gln Lys Gln Glu Gln Pro Ile Cys Ser Pro Lys Ile Ile Leu Pro Asn Pro Asn Lys Lys Ser Asp 2.5 Val Ile Ala Arg Ser Glu Glu Val Gln Ala Ile Ile Asp Arg Met Pro Thr Tyr Trp Thr Lys Trp Val Ile Leu Cys Val Gly Val Leu Met Gly 55 Met Ile Ile Leu Leu Gly Phe Leu Ile Gln Tyr Pro Asp Thr Val Asp 70 75 Gly Gln Ile Ser Val Thr Ala Asn Ala Ala Pro Val Arg Leu Val Ala 85 90 Asn Ser Asn Gly Arg Ile Thr Leu Phe Gln Pro Asn Lys Ala Leu Leu 105 His Lys Asn Asp Val Ile Ser Cys Ile Glu Ser Gly Ala Asp Tyr Lys 120 His Ile Leu Trp Ile Asp Ser Phe Leu Lys Thr Leu Asn Asp Lys Ser 135 140 Thr Ile Arg Val Ala Leu Pro Asp Thr Leu Leu Leu Gly Glu Val Ser 155 150 Ser Ala Tyr Asn Ser Phe Leu Leu Ser Phe Leu Gln Tyr Glu Arg Leu 170 Leu Thr Ser Asp Ile Tyr Ser Thr Met Arg Gln Lys Leu Gln Gln 180 185 Ile Ile Ser Asp Glu Ala Val Ile Ala Asn Phe Asn Asn Glu Leu Arg 200 205 Leu Lys Lys Gln Ile Leu Asp Asn Ser Gln Asn Gln Leu Ser Lys Asp 215 220 Ser Ile Leu Leu Ser Met Lys Gly Ile Ser Glu Gln Glu Tyr Gln Gln 230 235 Lys Phe Ser Thr His Leu Ser Leu Lys Glu Ser Gln Leu Asn Leu Gln 245 250 Ser Asn Arg Gln Met Lys Gln Ser Glu Ile Ser Arg Asn Gln Leu Glu 265 Ile Gln Arg Ile Cys Leu Glu Glu Thr Glu Ala Lys Glu Lys Ala Tyr 280

Ser Asp Tyr Ile Thr Arg Lys Asn Glu Leu Ser Asn Ala Ile Lys Leu

300 295 Trp Lys Glu His Tyr Leu Gln Tyr Ala Pro Val Glu Gly Glu Leu Glu 310 315 Tyr Leu Gly Phe Trp Arg Asn Asn Arg Phe Val Gln Ser Gly Gln Glu 330 325 Leu Phe Ser Ile Ile Pro Asp Lys Thr Asn Ile Leu Gly Glu Val Val 345 Ile Pro Ser Phe Gly Ala Gly Lys Val Glu Val Gly Gln Thr Val Asn 360 Val Lys Met Asp Asn Tyr Pro Tyr Asp Glu Tyr Gly Leu Leu Lys Gly 375 Val Val Lys Ser Val Ser Arg Ile Thr Asn Lys Ile Lys Thr Gln Asn 390 395 Gly Asp Met Asp Thr Tyr Leu Val Ile Ile Ser Phe Pro Asp Gly Thr 405 410 Leu Thr Asn Phe Gly Lys Ile Leu Pro Leu Asp Phe Glu Thr Lys Gly 425 420 Thr Val Glu Ile Ile Thr Lys Arg Lys Arg Leu Ile Glu Arg Leu Phe 440 Asp Asn Leu Lys Ser Lys Gly Glu Lys 455 <210> 5739 <211> 607 <212> PRT <213> B.fragilis <400> 5739 Ile Ile Leu Asn Met Asn Ser Ile Thr Lys Leu His Val Leu Phe Phe 10 Phe Val Phe Ile Phe Tyr Thr Val Ser Cys Thr Ala Lys Leu Glu Lys Gln Thr Tyr Thr Asn Val Tyr Asp Leu His Phe Ala Met Arg Ser Asp 40 Ser Ala Val Val Tyr Pro Trp Arg Glu Asn Gly Ala Tyr Ser Asn Tyr 55 Thr Ile Pro Ala Tyr Ile Gln Asp Ser Asn Arg Asn Leu Phe Ala Lys 75 70 Lys Tyr Phe Lys Gly Phe Pro Phe Ser Lys Arg Leu Arg Ser Glu Tyr 90 Glu Gln Arg Ile Leu Leu Pro Asn Asn Asn Ile Lys Glu Ala Val Ile 105 Gly Phe Glu Gly Lys Gly Asp Asn Ile Lys Leu Val Ser Ile Ile Leu 120 125 Asp Ala Ile Gly Lys Gln Glu Asn Ile Leu Phe Ser Asp Thr Leu Arg 135 140 Phe Arg Pro Asp Ser Ile Leu Ser Leu Val Thr Gln Asn Ile Asn Leu 150 155 Thr Asn Ala Glu Met Leu Asn Val Arg Ile Asn Val Glu Gly Glu Ile 170 165 Asp Lys Asn Ala Tyr Ile Ala Phe Ser Arg Leu Asp Ile Leu Ile Asp 185 Gly Lys Pro Ile Asp Glu Phe Pro Val Arg Thr Leu Ser Pro Leu Ile 200 Val Asp Lys Lys Ile Asn Tyr Thr Gly Ile Asn Val Asp Arg Lys Ile 215 220 Gly Leu Glu Gln Ile Asn Glu Ile Asn Asp Lys Lys Ile Ile Gly Leu 235 Gly Glu Ser Val His Gly Asn Asp Gly Ile Lys Asn Leu Ala Tyr Gln

245 250 Leu Ile Ile Gln Ala Val Glu Arg Leu Asn Cys Lys Leu Val Leu Gln 265 Glu Met Pro Leu Glu Gln Ser Phe Ala Tyr Asn Arg Phe Ile Gln Asp 280 Asp Asn Tyr Glu Leu Asp Ser Ser Leu Val Ile Asn His Ala Thr Ile 295 Asn Phe Leu Lys Arg Leu Arg Ser Phe Asn Ser Gly Lys Thr Lys Asp 315 310 Ser Lys Val Lys Leu Tyr Gly Met Asp Tyr Asn Ser Ile Leu Ser Ser 330 Thr Gln Ser Ser Ala Met Asp Ile Phe Asp Phe Ile Thr Gly Leu Asn 345 Lys Lys Ser Gln Ile Pro Glu Val Asp Gln Leu Ser Leu Leu Met 360 Lys Lys Asp Arg Asn Cys Ala Ile Asn Phe Leu Asp Ile His Arg Asp 380 375 Lys Ile Lys Lys Leu Leu Thr Ala Glu Glu Ile Glu Cys Ile Leu His 390 395 Ile Leu Arg Val Ser Lys Gln Ala Gly Asp Gly Gly Ile Glu Arg Phe 410 405 Ile Arg Arg Asp Ser Ile Met Phe Val Asn Ala Arg Phe Leu Ile Asp 425 Lys Phe Ala Lys Asp Glu Asn Val Lys Thr Val Ile Tyr Gly His Ala 440 Gly His Ile Asn Pro Ile Ser Ser Tyr Pro Ala Val Pro Cys Ile Pro 455 460 Phe Gly Arg Tyr Met Arg Lys Ala Tyr Gly Glu Ser Tyr Ser Pro Leu 475 470 Leu Phe Leu Ile Gly Ser Gly Glu Ala Met Ala Tyr Asp Glu His Tyr 485 490 Asn Arg Lys Asp Asn Trp Leu Ser Ser Pro Pro Glu Asn Ser Met Glu 505 Tyr Phe Leu Ser Leu Ile Asp Asp Asn Val Phe Tyr Thr Pro Leu Thr 520 525 Val Asp Phe Asn Glu Leu Thr Leu Ser Arg Leu Gln Gly Ser His His 535 Ile Pro Gln Glu Phe Tyr Pro Phe Asn Leu Tyr Gln Arg Phe Lys Gly 555 Val Phe Phe Ile Lys Ser Thr Asp Cys Thr His Lys Asp Glu Lys Glu 565 570 Ile Ser Phe Glu Lys Ala Ser Asp Arg Leu Ile Met Lys Ile Lys Gln 585 Arg Gln Glu Lys Ile Lys Glu Ile Gln Lys Arg Ile Glu Asn Leu 600

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<211> 84

<212> PRT

<213> B.fragilis

<400> 5740

Met Lys Ile Lys Lys Tyr Cys Arg Tyr Ile His Leu Trp Leu Ser Leu Pro Ala Gly Ile Leu Ile Ser Ile Ile Cys Phe Thr Gly Ala Ile Leu Val Phe Lys Glu Glu Leu Leu Thr Ile Met Gly Tyr Asp Ser Ile Arg 40 Glu Ser Pro Leu Met Ile Val Met Lys Leu His Arg Trp Val Lys Asp 55 60

Asp Asn Arg Pro Pro Gly Lys Met Ile Val Ser Ile Phe Thr Phe Phe 65 70 75 80

Ser Ser Leu Ser

<210> 5741 <211> 104 <212> PRT <213> B.fragilis

<400> 5741

Asn Ile Lys Lys Gly Arg Arg Arg Leu Met Phe Asp Tyr His Ser Val

1 5 10 15

Leu Gly Leu Tyr Ala Ala Leu Ile Leu Leu Val Cys Ala Leu Thr Gly
20 25 30

Leu Met Trp Ser Phe Gly Trp Tyr Arg Asp Ile Val Ser Phe Ile Phe

Leu Met Trp Ser Phe Gln Trp Tyr Arg Asp Ile Val Ser Phe Ile Phe 35 40 45

Asp Ala Glu Val Lys Arg Gly Ala Pro Ile Trp Lys Ile Val Arg Ala
50
55
60

Leu His Phe Gly Thr Tyr Ala Gly Met Phe Ser Lys Ile Val Thr Phe 65 70 75 80

Ile Ala Ala Leu Ile Gly Thr Ser Leu Pro Val Thr Gly Tyr Trp Met

Tyr Leu Lys Arg Lys Lys Leu Leu 100

<210> 5742 <211> 538 <212> PRT

<213> B.fragilis

<400> 5742

Phe Met Lys Asn Asn Cys Leu Ile Cys Ser Leu Leu Phe Ala Ser Gly 1 5 10 15

Ile Gln Asn Ala Trp Gly Thr Gln Ile Thr Asp Arg Lys Ala Asn Pro 20 25 30

Asp Gln Ala Lys Pro Asn Ile Ile Leu Ile Met Cys Asp Asp Met Gly 35 40 45

Phe Ser Asp Leu Ser Cys Tyr Gly Glu Val His Thr Pro His Ile 50 55 60

Asp Phe Leu Ala Glu Asn Gly Ile Arg Phe Ser Gln Phe Lys Asn Thr 65 70 75 80 Gly Arg Ser Cys Pro Ser Arg Ala Ala Leu Leu Thr Gly Arg Tyr Gln

85 90 95 His Glu Val Gly Met Gly Trp Met Thr Ala Val Asp Glu His Arg Pro

100 105 110

Gly Tyr Arg Gly Gln Ile Ser Asp Arg Tyr Pro Thr Ile Ala Glu Val
115 120 125

Phe Arg Glu Asn Gly Tyr His Thr Tyr Met Ser Gly Lys Trp His Val

Thr Val Glu Gly Ala Phe Thr Gln Pro Asn Gly Ser Tyr Pro Val Glu
145 150 155 160

Arg Gly Phe Glu Lys Tyr Tyr Gly Cys Leu Ser Gly Gly Gly Asn Tyr
165 170 175

Tyr Thr Pro Lys Pro Val Phe Ser Gly Leu Gln Arg Ile Thr Glu Phe 180 185 190

Pro Lys Asp Tyr Tyr Thr Thr Ala Ile Thr Asp Ser Ala Val Ser
195 200 205

2473 Phe Ile Arg Gln His Pro Val Asp Glu Pro Met Phe Met Tyr Leu Ala 220 215 His Tyr Ala Pro His Leu Pro Leu Gln Ala Pro Lys Glu Arg Val Glu 230 235 Ala Cys Arg Glu Lys Tyr Lys Ala Gly Tyr Asp Val Leu Arg Lys Gln 250 245 Arg Phe Glu Arg Ile Arg Arg Asn Gly Leu Ile Asp Ile Glu Arg Glu Leu Pro Val Phe Glu Lys Glu Phe Gly Gly Lys Arg Pro Ala Trp Asn 280 Ser Leu Thr Pro Gln Gln Gln Glu Arg Trp Ile Thr Glu Met Ala Thr 295 300 Tyr Ala Ala Met Ile Glu Ile Met Asp Asp Gly Ile Gly Glu Val Ile 310 315 Lys Ala Thr Lys Glu Lys Gly Ile Phe Asp Asn Thr Ile Phe Leu Phe 330 Leu Ser Asp Asn Gly Ala Thr Asn Glu Gly Asp Met Ile Thr Gln Leu 345 350 340 Arg Ala Asp Leu Ser Asn Thr Pro Phe Arg Ser Tyr Lys Gln Trp Cys 360 Phe Gln Gly Gly Thr Ser Ala Pro Leu Ile Ile Met Tyr Gly Gly 375 380 Gln Pro Asp Gly Lys Lys Glu Ala Val Arg His Glu Phe Thr His Ile 390 395 Ile Asp Leu Phe Pro Thr Cys Leu Asp Met Ala Ser Ile Glu Tyr Pro 405 410 Arg Glu Phe Arg Asn His Ala Ile Asp Ala Pro Gly Gly Arg Thr Ile 425 Leu Pro Ala Leu Lys Gly Lys Lys Leu Ser Lys Arg Asp Leu Phe Phe 440 Glu His Gln Thr Ser Cys Gly Ile Ile Ser Gly Asp Trp Lys Leu Val 455 460 Arg Ala Asn Gly Lys Gln Pro Trp Glu Leu Phe Asn Leu Leu Gln Asp 475 470 Pro Phe Glu Gln Asn Asp Leu Ser Ala Arg Tyr Pro Asp Arg Val Lys 485 490 Thr Leu Glu Lys Lys Trp Asn Gln Trp Ala Glu Lys Gln Gln Val Phe 505 Pro Phe Glu Tyr Arg Pro Trp Thr Lys Arg Ile Asn Tyr Tyr Lys Ser 520 Leu Tyr Pro Asp Gln Ser Gly Lys Asp Leu 530 535

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<211> 338

<212> PRT

<213> B.fragilis

<400> 5743

Val Met Cys Gly Val His Phe Met Gly Glu Thr Ala Lys Val Leu Cys 90 85 Pro Asp Lys Lys Val Leu Val Pro Asp Leu Asn Ala Gly Cys Ser Leu 105 Ala Asp Ser Cys Pro Ala Asp Lys Phe Ala Glu Phe Val Lys Ala His 120 Pro Gly Tyr Thr Val Ile Ser Tyr Val Asn Thr Thr Ala Ala Val Lys 135 Ala Val Thr Asp Val Val Thr Ser Thr Asn Ala Lys Gln Ile Val 155 150 Glu Ser Phe Pro Lys Asp Glu Lys Ile Ile Phe Gly Pro Asp Arg Asn 170 165 Leu Gly Asn Tyr Ile Asn Ser Ile Thr Gly Arg Glu Met Leu Leu Trp 180 185 Asp Gly Ala Cys His Val His Glu Gln Phe Ser Val Glu Lys Ile Val 200 Glu Leu Lys Ala Gln Tyr Pro Asp Ala Val Val Leu Ala His Pro Glu 215 220 Cvs Lvs Ser Val Val Leu Lys Leu Ala Asp Met Val Gly Ser Thr Ala 235 230 Ala Leu Leu Lys Tyr Ala Val Asn Ser Asp Lys Gln Arg Phe Ile Val 250 245 Ala Thr Glu Ala Gly Ile Leu His Glu Met Gln Lys Lys Cys Pro Gln 265 Lys Thr Phe Ile Pro Ala Pro Pro Asn Asp Ser Thr Cys Gly Cys Asn 280 Glu Cys Asn Phe Met Arg Leu Asn Thr Leu Glu Lys Leu Tyr Asn Cys 295 Leu Lys Tyr Glu Phe Pro Glu Val Thr Val Asp Pro Glu Val Ala Arg 315 310 Glu Ala Val Lys Pro Ile Lys Arg Met Leu Glu Ile Ser Ala Lys Leu 325 330 Gly Leu

<210> 5744 <211> 474 <212> PRT <213> B.fragilis

<400> 5744

Asn Thr Met Lys Asn Lys Leu Phe Ile Leu Phe Ala Phe Cys Ile Ser 10 Val His Val Tyr Ala Gln Gln Pro Ser Arg Glu Ile Pro Leu Lys Tyr 25 Gly Ala Thr Asn Ile Gly Lys Arg Gln Asp Asp Ala Met Lys Arg Phe 40 Arg Asn Asn Arg Leu Gly Glu Phe Ile His Trp Gly Leu Tyr Ala Ile 55 Pro Gly Gly Glu Trp Lys Gly Lys Val Tyr Asn Gly Ala Ala Glu Trp 70 75 Leu Lys Ser Trp Ala Lys Val Pro Ala Ala Asp Trp Leu Glu Leu Met 90 Lys Gln Trp Asn Pro Val Lys Phe Asp Ala Arg Gln Trp Ala Arg Met 105 Ala Lys Glu Met Gly Val Lys Tyr Val Lys Ile Thr Thr Lys His His 120 Glu Gly Phe Cys Leu Trp Pro Ser Gln Tyr Ser Gln Tyr Thr Val Ala 135 130

Gln Thr Pro Tyr Arg Lys Asp Ile Leu Gly Glu Leu Val Lys Ala Tyr 155 150 Asn Asp Glu Gly Ile Asp Val His Phe Tyr Phe Ser Val Met Asp Trp 170 Ser His Pro Asp Tyr Arg Tyr Glu Ile Thr Ser Lys Glu Asp Ser Ile 185 Ala Phe Ser Arg Phe Leu Thr Phe Thr Asp His Gln Leu Lys Glu Leu 200 Ala Thr Arg Tyr Pro Thr Val Lys Asp Phe Trp Phe Asp Gly Thr Trp 220 215 Asp Ala Ser Ile Lys Lys Asn Gly Trp Trp Thr Ala His Ala Glu Gln 235 230 Met Leu Lys Glu Leu Val Pro Gly Val Thr Val Asn Ser Arg Leu Arg 250 245 Ala Asp Asp Tyr Gly Lys Arg His Phe Asp Ser Asn Gly Arg Leu Met 265 260 Gly Asp Tyr Glu Ser Gly Tyr Glu Arg Arg Leu Pro Asp Pro Val Lys 280 Asp Leu Gln Val Thr Lys Trp Asp Trp Glu Ala Cys Met Thr Val Pro 295 Glu Asn Gln Trp Gly Tyr His Lys Asp Trp Ser Leu Ser Tyr Val Lys 310 315 Thr Pro Ile Glu Val Ile Asp Arg Ile Val His Ala Val Ser Met Gly 330 325 Gly Asn Met Val Val Asn Phe Gly Pro Gln Pro Asp Gly Asp Phe Arg 345 Ser Glu Glu Lys Glu Leu Ala Met Ala Leu Gly Cys Trp Met Lys Arg 360 Tyr Gly Glu Cys Ile Tyr Gly Cys Asp Tyr Ala Gly Trp Asp Lys Gln 380 375 Asp Trp Gly Tyr Tyr Thr Arg Lys Gly Gln Glu Val Tyr Met Val Val 395 390 Phe Asn Arg Pro Tyr Ser Gly Leu Leu Lys Val Lys Ile Pro Lys Gly 410 405 Thr Glu Ile Glu Arg Ala Val Leu Pro Asp Gly Gln Val Val Lys Val 425 420 Thr Glu Thr Ala Arg Asn Glu Tyr Asn Val Ala Met Pro Ser Gln Asp 445 440 Pro Gly Glu Pro Phe Ile Ile Lys Leu Gln Val Lys Glu Ala Ser Gly 455 Ala Ala Asp Gly Tyr Arg Asp Ala Leu Thr <210> 5745 <211> 304

<212> PRT

<213> B.fragilis

<400> 5745

Gln Gln Pro Lys Ser Lys Val Ser Met Cys Leu Leu Ile Gly Lys Leu 1 5 10 15

Leu Lys Asn Ser Ser Asn Asn Lys Glu Ile Asn Met Asn Asn Leu Leu 20 25 30

Leu Ser Ile Asn Trp Asn Pro Asn Pro Glu Leu Phe Asn Leu Phe Gly

35 40 45

Ile Ser Ile Arg Tyr Tyr Gly Leu Leu Trp Ala Ile Gly Ile Phe Phe 50 55 60

Ala Tyr Ile Val Val His Tyr Gln Tyr Arg Asp Lys Lys Ile Asp Glu 65 70 75 80 Lys Lys Phe Glu Pro Leu Phe Phe Tyr Cys Phe Phe Gly Ile Leu Ile 90 85 Gly Ala Arg Leu Gly His Cys Leu Phe Tyr Asp Pro Gly Tyr Tyr Leu Asn His Phe Trp Glu Met Ile Leu Pro Val Lys Phe Leu Pro Gly Gly 120 Gly Trp Lys Phe Thr Gly Tyr Glu Gly Leu Ala Ser His Gly Gly Thr 135 Leu Gly Leu Ile Ile Ser Leu Trp Leu Tyr Cys Arg Lys Thr Lys Met 150 155 Asn Tyr Met Asp Val Val Asp Met Ile Ala Val Ala Thr Pro Ile Thr 170 Ala Cys Phe Ile Arg Leu Ala Asn Leu Met Asn Ser Glu Ile Ile Gly 185 180 Lys Val Thr Asp Val Ser Trp Ala Phe Val Phe Glu Arg Val Asp Met 200 Gln Pro Arg His Pro Ala Gln Leu Tyr Glu Ala Ile Ala Tyr Phe Ile 215 220 Leu Phe Leu Val Met Met Phe Leu Tyr Lys Asn Tyr Ser Lys Lys Leu 235 230 His Arg Gly Phe Phe Phe Gly Leu Cys Leu Thr Ala Ile Phe Thr Phe 250 245 Arg Phe Phe Val Glu Phe Leu Lys Glu Asn Gln Val Asp Phe Glu Asn 265 Ser Met Ala Leu Asn Met Gly Gln Trp Leu Ser Ile Pro Phe Val Ile 280 Ile Gly Ile Tyr Phe Met Phe Phe Tyr Gly Lys Lys Ser Val Lys

<210> 5746 <211> 244 <212> PRT

<213> B.fragilis

180

<400> 5746

His Gly Thr Glu His Gly Ser Met Val Lys His Pro Val Arg Asn Tyr Arg His Leu Leu Tyr Val Phe Leu Arg Lys Glu Lys Glu Cys Lys Met Lys His Ile Ile Asp Ile Lys Thr Trp Glu Arg Lys Glu Asn Tyr Glu Phe Phe Leu Gly Phe Gln Asn Pro Thr Ile Ser Ile Thr Ser Glu Val 55 Glu Cys Ser Gly Ala Arg Thr Arg Ala Lys Thr Ala Gly Glu Ser Phe Phe Leu His Tyr Leu Tyr Ala Val Leu Arg Ala Val Asn Glu Ile Lys 85 90 Glu Phe Arg Phe Arg Ile Asp Ser Glu Gly Arg Val Val Tyr Phe Asp 105 Thr Val Asp Met Leu Thr Pro Ile Lys Val Ala Asp Asn Gly Arg Phe 120 125 Phe Thr Val Arg Leu Pro Trp Tyr Pro Asp Phe Lys Thr Phe Tyr Thr 135 140 Glu Ala Lys Ala Ile Ile Ser Gly Ile Asp Pro Asp Lys Asp Pro Tyr 150 155 Glu Ala Glu Lys Thr Gly Gly Ser Asp Leu Leu Asp Val Val Leu Leu 170 Ser Ala Thr Pro Asp Leu Tyr Phe Thr Ser Leu Thr Cys Thr Gln Glu

2477

His Arg His Gly Gly Asn Tyr Pro Leu Met Asn Ala Gly Lys Ala Val
195

Ile Arg Gly Gly Val Leu Val Met Pro Ile Ala Met Thr Ile His His
210

Cly Phe Ile Asp Gly His His Leu Ser Leu Phe Tyr Lys Lys Val Glu
225

Clu Phe Leu Lys

<210> 5747 <211> 627 <212> PRT <213> B.fragilis

<400> 5747 Ala Tyr Asn Glu Asn Lys Thr Lys Thr Gly Lys Asn Lys Gly Asp Thr 10 Glu Ala Asp Arg Lys Phe Ile Lys Thr Pro Val Met Lys Tyr Phe Ile Leu Leu Ala Ser Val Leu Phe Leu Ala Gln Ser Cys Ser Val Ala Pro 40 Ser Met Arg Glu Ser Ala Arg Ser Tyr Asp Trp Val Ala Asn Thr Asn 55 Phe Ser Trp Gln Ser Lys Ile Asp Ser Ala Ile Ser Ser Tyr Pro Leu 75 70 Leu Leu His Pro Ser Tyr Glu Ala Lys Gly Ser Val Gly Phe Thr Val 90 Pro Val Phe Tyr Arg Met Asp Lys Lys Arg Val Gly Val Glu Val Arg 105 100 Ile Lys Tyr Lys Thr Glu Asn Cys Asn Asp Leu Cys Leu Lys Leu Ser 120 125 Gly Ile Gly Glu Cys Gly Lys Val Ile Ser Ala Asp Thr Phe Arg Leu 135 140 Ser Ala Ala Glu Ala Trp Thr Val Ala Arg Arg Ser Val Asp Met Ala 155 Ser Pro Leu Leu Gly Val Ala Leu Glu Ala Arg Gly Glu Lys Pro 170 165 Gly Lys Lys Asp Phe Pro Ala Asp Pro Leu Gly Trp Glu Asn Asn Ser Phe Lys Pro Gly Glu Tyr Ser Lys Ile Trp Ile Asp Ser Leu Asp Ile 200 Leu Ile Asp Gly Lys Tyr Ala Val Glu Leu Pro Ser Leu Asn Asn Gly 220 Thr Ala Ala Ser Val Arg Glu Ser Asp Val Met Pro Ala Asn Gly Gly 235 230 Asp Leu Lys Ser Leu Pro Phe Ser Gly Lys Arg Ile Leu Ala Ile Gly 250 245 Glu Ser Val His Gly Thr Gly Thr Met Asn Asp Met Gly Val Glu Ile 265

Leu Ile Asp Gly Lys Tyr Ala Val Glu Leu Pro Ser Leu Asn Asn Gly 210 215 220

Thr Ala Ala Ser Val Arg Glu Ser Asp Val Met Pro Ala Asn Gly Gly 230 235 240

Asp Leu Lys Ser Leu Pro Phe Ser Gly Lys Arg Ile Leu Ala Ile Gly 245 250 255

Glu Ser Val His Gly Thr Gly Thr Met Asn Asp Met Gly Val Glu Ile 260 265

Ile Lys Asn Arg Ile Glu His Gly Lys Cys Arg Leu Val Leu Glu 270

Ile Pro Leu Thr Leu Ser Phe His Ile Asn Arg Tyr Leu Glu Gly 290

Glu Arg Phe Lys Pro Asp Ser Ile Ala Ser Tyr Phe Asp Lys Val Leu 305

Phe Ser Ser Ser Ser Phe Val Ser Leu Met Arg Trp Val Lys Glu Tyr 325

Asn Arg His Leu Glu Glu Lys Val Ser Phe Phe Gly Ile Asp Arg Asn 330

Asn Arg His Leu Glu Glu Lys Val Ser Phe Phe Gly Ile Asp Arg Asn 350

Ile Tyr Arg Leu Gln Ser Ser Ile Asp Leu Phe Tyr Phe Phe Tyr Thr 360 365 Leu Arg Arg Gly Lys Gly Asp Glu Gly Leu Lys Ala Ile Cys Glu Ser 375 Leu Leu Ser Asp Glu Lys Phe Pro Phe Lys Gly Ala Asp Ser Val 390 395 Leu His Ala Asn His Gly Phe Lys Gly Ile Leu Thr Arg Arg Glu Ala Glu Ile Met Ser Tyr Cys Leu Asn Ser Glu Glu Glu Ala Thr Ala Asp 420 425 Glu Leu Asn Arg Phe Arg Gly Arg Asp Ser Gly Met Tyr Glu Asn Ala 440 Lys Phe Leu Met Lys Thr Met Leu Lys Lys Asp Glu Thr Thr Thr Val 455 460 Tyr Cys His Leu Gly His Ala Asn Tyr Thr Ser Ile Ala Gly Trp Leu 475 470 Arg Pro Asp Met Arg Pro Phe Gly Glu Tyr Met Lys Gly Ser Tyr Gly 490 485 Asp Asp Tyr Ser Ala Val Gly Leu Leu Ala Gly Gly Ser Tyr Leu 505 Thr Trp Val Phe Pro Gly Lys Met Gly Ile Arg Arg Leu Gln Ser Ser 520 Ser Ser Ala Gly Leu Glu Tyr Cys Ile Glu Arg Ser Gly Ile Ser Pro 535 Cys Tyr Leu Pro Met Asp Lys Leu Ser Asp Ala Asp Val Leu Lys Met 550 555 Arg Tyr Ile Gly Asn Thr Glu Ser Lys Ile Gly Gln Phe Gln Trp Val 570 Phe Pro Lys Cys Met Met Asp Gly Val Leu Phe Thr Lys Asn Ala Ser 585 580 Ala Thr Asn Lys Arg Glu Glu Phe Phe Lys Met Asn Leu Asp Tyr His 600 Val Gln Thr Leu Phe Ala Leu Met Tyr Leu Tyr Glu Lys Lys Arg Lys 610 615 Trp Ile Pro <210> 5748 <211> 374 <212> PRT <213> B.fragilis <400> 5748 Tyr Lys Lys Asp Tyr Asn Ile Met Ala Leu Gln Cys Gly Ile Val Gly Leu Pro Asn Val Gly Lys Ser Thr Leu Phe Asn Cys Leu Ser Asn Ala 25 Lys Ala Gln Ala Ala Asn Phe Pro Phe Cys Thr Ile Glu Pro Asn Val 40 Gly Val Ile Thr Val Pro Asp Glu Arg Leu Asn Lys Leu Ala Glu Leu 55 60 Val His Pro Asn Arg Ile Val Pro Thr Thr Val Glu Ile Val Asp Ile 75

Ala Gly Leu Val Lys Gly Ala Ser Lys Gly Glu Gly Leu Gly Asn Lys 90 85 Phe Leu Ala Asn Ile Arg Glu Thr Asp Ala Ile Ile His Val Leu Arg 105 Cys Phe Asp Asp Asp Asn Val Thr His Val Asp Gly Ser Val Asn Pro 120 125 115

Val Arg Asp Lys Glu Ile Ile Asp Tyr Glu Leu Gln Leu Lys Asp Leu 135 140 Glu Thr Ile Glu Ser Arg Ile Gln Lys Val Gln Lys Gln Ala Gln Thr 150 155 Gly Gly Asp Lys Ala Ala Lys Gln Ala Tyr Asp Val Leu Val Gln Phe 165 170 Lys Asp Ala Leu Glu Gln Gly Lys Ser Ala Arg Thr Val Thr Phe Glu 185 Thr Lys Asp Glu Gln Lys Ile Ala Lys Glu Leu Phe Leu Leu Thr Ser 200 Lys Pro Val Met Tyr Val Cys Asn Val Asp Glu Ala Ser Ala Val Asn 215 220 Gly Asn Lys Tyr Val Asp Met Val Arg Glu Ala Val Lys Asp Glu Asp 230 235 Ala Glu Ile Leu Val Val Ala Gly Lys Thr Glu Ala Asp Ile Ala Glu 245 250 Leu Glu Thr Tyr Glu Asp Arg Gln Met Phe Leu Ala Glu Ile Gly Leu 265 260 Glu Glu Ser Gly Val Ala Arg Leu Ile Lys Ser Ala Tyr Lys Leu Leu 280 285 Asn Leu Glu Thr Tyr Phe Thr Ala Gly Val Gln Glu Val Arg Ala Trp 295 300 Thr Tyr Glu Lys Gly Trp Lys Ala Pro Gln Cys Ala Gly Val Ile His 310 315 Thr Asp Phe Glu Lys Gly Phe Ile Arg Ala Glu Val Ile Lys Tyr Glu 325 330 Asp Phe Leu Gln Tyr Gly Ser Glu Ala Ala Val Lys Glu Ala Gly Lys 345 Leu Gly Val Glu Gly Lys Glu Tyr Val Val Gln Asp Gly Asp Ile Met 360 His Phe Arg Phe Asn Val 370 <210> 5749 <211> 735 <212> PRT <213> B.fragilis <400> 5749 Asn Gln Lys Glu Lys Asn Lys Asn Met Leu Leu His Arg Phe Pro Val Glu Tyr Gln Met Asp Ser Gln Asp Cys Gly Pro Ala Ser Leu Lys Ile 25 Ile Ala Lys His Phe Gly Lys Phe Tyr Ser Leu Gln Phe Met Arg Asp Arg Cys Gly Ile Thr Lys Glu Gly Val Ser Leu Leu Asp Leu Ser Thr 55 Gly Ala Glu Ser Ile Gly Leu Arg Thr Leu Ala Ile Lys Cys Thr Ile 70 75 Asp Asp Val Val Asn Ser Ile Pro Phe Pro Ala Ile Val Phe Trp Asn 90 85 Asp Ser His Phe Ile Val Val Tyr His Ser Asp Arg Lys Tyr Ile Trp 105 Val Ser Asp Pro Ala Lys Gly Arg Ile Lys Tyr Thr His Glu Glu Phe 120 Arg Lys Gly Trp Tyr Gln Arg Asp Glu Ser Gln Gly Val Leu Leu Ala 135 Val Glu Pro Thr Thr Asp Phe Lys Asn Ser Lys Ala Glu Gln Gln Gln 145 150 155

Lys Arg Asn Ser Phe Ser Ser Ile Leu Lys Tyr Phe Phe Pro Tyr Lys 165 170 175 Lys Ser Phe Gly Leu Ile Phe Ile Ile Met Leu Val Val Thr Val Leu 185 Gln Gly Met Leu Pro Phe Ile Ser Lys Ala Val Ile Asp Val Gly Ile 200 Lys Thr Ser Asp Arg Asn Phe Ile Asn Met Val Leu Ile Gly Asn Ile 215 Cys Ile Leu Leu Ser Val Met Ile Phe Asn Val Leu Arg Asp Trp Ile 235 230 Leu Leu His Ile Thr Ala Arg Val Asn Ile Ala Leu Ile Ser Asp Tyr 250 245 Leu Ile Lys Leu Met Lys Leu Pro Val Thr Phe Phe Glu Asn Lys Leu 265 Leu Gly Asp Ile Leu Gln Arg Ala Gln Asp His Glu Arg Ile Arg Ser 280 2.75 Phe Ile Met Asn Asn Ser Leu Ala Leu Ile Phe Ser Thr Leu Thr Phe 295 300 Ala Val Phe Ser Ile Ile Leu Leu Ile Tyr Asn Thr Ile Ile Phe Tyr 315 310 Ile Phe Leu Ser Gly Ser Val Leu Tyr Ala Cys Trp Val Leu Leu Phe 325 330 Leu Ser Ile Arg Lys Lys Leu Asp Trp Glu Tyr Phe Glu Leu Leu Ser 345 Lys Asn Gln Ser Tyr Trp Val Glu Thr Val Ser Thr Ile Gln Asp Ile 360 Lys Ile Tyr Asn Tyr Asp Lys Tyr Arg Arg Trp Lys Trp Glu Glu Ile 375 Gln Ala Arg Leu Tyr His Val Asn Lys Arg Val Leu Ala Ile Thr Asn 395 390 Ala Gln Asn Leu Gly Ala Gln Phe Ile Glu Asn Ile Lys Asn Met Ala 405 410 Ile Val Phe Phe Cys Ala Met Ala Val Ile Lys Gly Glu Ile Thr Phe 425 Gly Ile Met Ile Ser Thr Gln Phe Ile Ile Gly Met Leu Asn Gly Pro 440 Leu Val Gln Phe Ile Asn Phe Val Val Ser Ala Gln Tyr Ala Lys Ile 460 455 Ser Phe Leu Arg Ile Asn Glu Ile Arg Gln Leu Glu Asn Glu Asp Glu 470 475 Leu Leu Ser Ile Gly Ser Thr Thr Ile Leu Pro Glu Arg Lys Thr Ile 490 485 Leu Leu Glu Asn Ile His Phe Gln Tyr Thr Pro Asn Ser Pro Leu Val 505 Leu Arg Asn Ile Tyr Leu Gln Ile Pro Glu Asn Lys Ile Thr Ala Ile 520 Val Gly Gly Ser Gly Ser Gly Lys Ser Thr Leu Leu Lys Leu Leu Val 535 540 Arg Leu Tyr Lys Pro Ser His Gly Glu Ile Lys Met Asp Lys Met Asn 550 555 Val Ser Ala Ile Asn Leu Arg Gln Trp Arg Asn Met Cys Gly Val Val 570 Met Gln Asp Gly Lys Ile Phe Ser Asp Thr Ile Leu Asn Asn Ile Val 585 580 Leu Asp Asp Glu Gln Ile Asn Tyr Thr Arg Leu Arg Glu Val Cys Arg 600 Ile Ala Gln Ile Glu Asp Glu Ile Asn Ala Met Pro Lys Gly Phe Glu 615 Thr Thr Ile Gly Glu Thr Gly Arg Gly Leu Ser Gly Gly Gln Lys Gln

630 635 625 Arg Leu Leu Ile Ala Arg Ala Leu Tyr Arg Asp Pro Lys Phe Leu Phe 650 645 Met Asp Glu Ala Thr Asn Ser Leu Asp Ser Ile Asn Glu Arg Lys Ile 665 660 Val Asn Ala Leu Asn Asn Ala Phe Glu Gln Arg Thr Val Val Ile 680 Ala His Arg Leu Ser Thr Ile Arg Asn Ala Asp Gln Ile Val Val Leu 695 700 Asp Lys Gly Phe Ile Val Glu Thr Gly Thr His Glu Ile Leu Met Glu 710 715 Lys Lys Gly His Tyr Phe Glu Leu Val Ser Ser Gln Ile Gln Asp 730 725

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<212> PRT

<213> B.fragilis

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165 170 Val Tyr Ser Ser Gln Asp Phe Phe Met His Thr Phe Val Glu Arg Leu 180 185 Arg Asn Lys Gly Ile Glu Ile Ser Asn His Tyr Ala Phe Asp Ser Phe 205 200 Arg Ser Asp Ser Leu Ser Ile Cys Met Ala Arg Trp Glu Cys Pro Val 215 Gln Asp Val Ile Asp Gln Ile Met Lys Glu Ser Asp Asn Leu Ser Ala 235 230 Glu Ala Leu Leu Cys Arg Leu Gly Ala Arg Ala Thr Gly Lys Lys Gln 250 Val Ser Ala Lys Asp Gly Ile Glu Glu Ile Tyr Arg Leu Ile Gln Asp 265 260

Leu Ile Val Ser Gly Asn Val Glu Asn Arg Arg Ile Gly Asp Val Asn

Leu Gly His Asp Pro Asp Asn Tyr Lys Ile Ala Asp Gly Cys Gly Leu 285 280 Ser Asn Tyr Asp Tyr Leu Ser Pro Ala Leu Leu Val Asp Phe Leu Lys 295 Phe Ala Tyr Ser Arg Thr Asp Ile Phe Arg Lys Leu Tyr Lys Ala Leu 315 310 Pro Val Ala Gly Ile Asp Gly Thr Leu Lys Asn Arg Met Lys Gln Gly 325 330 Ala Ala Phe Lys Asn Val His Ala Lys Thr Gly Ser Tyr Thr Ala Ile 345 Asn Thr Leu Ala Gly Tyr Leu Lys Met Ala Asn Gly His Gln Val Ala 360 Phe Ala Ile Met Asn Gln Asn Ile Leu Ser Ala Ala Lys Ala Arg Asn 380 375 Phe Gln Asn Lys Val Cys Glu Ile Leu Ala Asn His Gln 390

<210> 5751

<211> 527

<212> PRT

<213> B.fragilis

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265 Arg Thr Met Asp Gly Lys Glu Phe Met Gln Lys Tyr Asp Pro Arg Leu

280

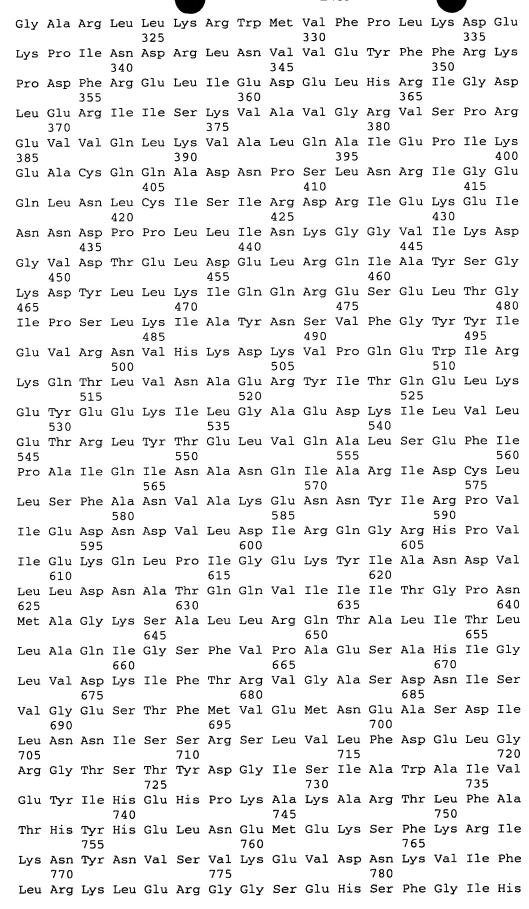
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Ala Phe Lys Gly Asn Cys Ile Val Gln Thr Met Phe Met Lys Gly Lys 180 185 Tyr Lys Gly Lys Asp Val Asp Asn Thr Ser Asp Lys Tyr Val Leu Pro 200 Trp Leu Lys Val Val Lys Asp Ile Ala Pro Arg Gln Val Met Ile Tyr 215 220 Thr Ile Asp Arg Glu Thr Pro Asp Gln Asp Leu Gln Lys Ala Thr His 230 235 Glu Glu Leu Asp Arg Ile Val Ala Leu Leu Thr Lys Glu Gly Leu Ser 245 250 Ala Thr Ala Ser Tyr <210> 5753

<211> 892 <212> PRT <213> B.fragilis

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<210> 5754 <211> 599 <212> PRT

<213> B.fragilis

<400> 5754

Val Val Asn Ile Asp Asn Asn Leu Val Tyr Phe Met Lys Thr Lys Leu 10 Pro Leu Leu Leu Phe Phe Val Leu Phe Leu Phe Lys Cys Asp Leu Lys Ala Asp Pro Gly His Lys Ser Pro Leu Glu Tyr Arg Trp Val Asn 40 His Pro Leu Asp Phe Tyr Leu Asn Val Thr Val Asp Ser Thr Thr Thr Pro His Ser Leu Leu Phe Glu Thr Met Tyr Glu Lys Lys Gly Ile Ala 70 75 Ser Phe Leu Leu Pro Ile Tyr Gln Leu Glu Lys Asn Ser Leu Thr Phe 90 Glu Ile Lys Ile Arg Tyr Lys Thr Glu Asn Cys Glu Asn Leu Phe Leu 100 105 Ala Ile Thr Ser Val Gly Asp Cys Glu Asn Ile Asn Ser Ile Asp Thr 120 Ile Gln Leu Asn Ala Thr Gln Asp Trp Lys Glu Cys Thr Arg Ile Leu 135 140 Lys Thr Lys Lys Ala Tyr Phe Leu Asn Ile Ser Val Gly Ala Val Gly 150 155 Tyr Gly Gln Arg Lys Gly Lys Ile Trp Ile Ser Asp Leu Glu Val Leu 165 170 Gly Asp Gly Lys Ala Ile Gly Asp Asn Pro Gln Glu Tyr Lys Lys 185 Glu Asp Ile His Leu Lys Ala Thr Asp Leu Ile His Trp Asn Asn Lys 200 Glu Tyr Asp Asn Leu Pro Phe Leu Asn Lys Lys Ile Leu Gly Leu Gly 215 220 Glu Thr Ala His Gly Thr Glu Thr Met Asn Asp Ile Gly Ile Glu Ile 230 235 Ser Lys Glu Arg Ile Leu Lys His Gln Cys Arg Phe Ile Leu Leu Glu 245 250 Ile Pro Leu Glu Phe Ser Leu Tyr Ile Asn Arg Tyr Val Gln Asn Asp 265 Lys Asn Phe Lys Phe Glu Tyr Ile Ser Glu Arg Phe Glu Pro Tyr Leu 280 Phe Ser Asp Ser Ile Leu Ser Phe Ile Arg Trp Ile Lys Glu Tyr Asn 295 Ser Ala His Asn Gln Lys Ile Ser Ile Leu Gly Phe Asp Leu Asn Thr

310 315 Thr Pro Leu Leu Ser Arg Ala Asp Leu Phe Asn Phe Phe Tyr Asn Leu 325 330 Lys Ser Gly Gly His Val Glu Glu Ile Asp Thr Ile Cys Glu Ser Leu 345 340 Leu Asp Ser Lys Thr Ser Phe Glu Lys Ile Ile Ser Lys Phe Asp Lys 360 Ser Ile Arg Leu Ala Asp Cys Leu Asp Lys Gly Glu Leu Lys Leu Ile 380 375 His Arg Cys Leu Glu Ile Thr Gly Arg Ser Ser Ser Tyr Phe Arg 395 390 Phe Val Glu Arg Asp Arg Tyr Met Asn Asp Ile Val Thr Phe Ile Ile 405 410 Asp His Phe Leu Asn Thr Asn Glu Thr Val Thr Leu Phe Gly His Leu 425 420 Gly His Leu Asn Tyr Lys Gly Asn Arg Val Glu Leu Met Asp Tyr Phe 445 440 Ser Leu Gly Tyr Tyr Leu Lys Ser Arg Tyr Ala Lys Asn Tyr Ser Cys 455 Ile Gly Leu Ile Thr Asn Arg Gly Thr Ala Met Leu Pro Val Ser Ala 475 470 Thr Asn Gly Gly Val Thr Lys Leu Glu Gln Ala Pro Gln Gly Ser Leu 485 490 Glu Phe Gln Val Asn Lys Leu Lys Met Asp Ser Val Tyr Leu Ser Met 505 500 Ser Lys Phe Thr Cys Ser Asp Val Phe Leu Leu Arg Glu Leu Gly Ser 520 Gly Phe Ser Gln Asn Lys Lys Ile Ile Pro Asn Gln Phe Gln Tyr Met 540 535 Ile Pro Lys Ser Arg Met Glu Gly Val Ile Phe Thr Lys Glu Ser Val 555 550 Asn Phe Met Lys Gly Lys Glu Phe Phe Lys Lys Asn Met Asn Val Glu 570 565 Val Val Thr Met Arg Phe Tyr Ile Lys Ala Leu Glu Lys Leu Thr Gln 585 Lys Lys Ile Asp Leu Asn Ile 595 <210> 5755 <211> 470 <212> PRT <213> B.fragilis <400> 5755 Ser Ser Ile Phe Ala Asp Ala Asn Leu Asn Ser Glu Phe Met Asn Glu 10 Leu Thr Gly Ala Asp Phe Lys Ser Ala Thr Ala Asp Asp Asn Lys Lys 25 Leu Phe Ile Glu Thr Tyr Gly Cys Gln Met Asn Val Ala Asp Ser Glu 40 Val Ile Ala Ser Val Met Gln Met Ala Gly Tyr Ser Val Ala Glu Thr Leu Glu Glu Ala Asp Ala Val Phe Met Asn Thr Cys Ser Ile Arg Asp 75 70

Asn Ala Glu Gln Lys Ile Leu Asn Arg Leu Glu Phe Phe His Ser Met

Lys Lys Lys Lys His Leu Ile Val Gly Val Leu Gly Cys Met Ala 100 105 110 Glu Arg Val Lys Asp Asp Leu Ile Glu His His His Val Asp Leu Val

Val Gly Pro Asp Ala Tyr Leu Thr Leu Pro Glu Leu Ile Ala Ser Val Glu Ala Gly Glu Lys Ala Met Asn Val Glu Leu Ser Thr Thr Glu Thr Tyr Arg Asp Val Ile Pro Ser Arg Ile Cys Gly Asn His Ile Ser Gly Phe Val Ser Ile Met Arg Gly Cys Asn Asn Phe Cys Thr Tyr Cys Ile Val Pro Tyr Thr Arg Gly Arg Glu Arg Ser Arg Asp Val Glu Ser Ile Leu Asn Glu Val Ala Asp Leu Val Ser Lys Gly Tyr Lys Glu Ile Thr Leu Leu Gly Gln Asn Val Asn Ser Tyr Arg Phe Glu Lys Glu Gly Gly Glu Val Val Thr Phe Pro Met Leu Leu Arg Leu Val Ala Glu Ala Ala Pro Gly Ile Arg Val Arg Phe Thr Thr Ser His Pro Lys Asp Met Ser Asp Glu Thr Leu Glu Val Ile Ala Gln Val Pro Asn Val Cys Lys His Ile His Leu Pro Val Gln Ser Gly Ser Ser Arg Ile Leu Lys Leu Met Asn Arg Lys Tyr Thr Arg Glu Trp Tyr Leu Asp Arg Val Ala Ala Ile Lys Arg Ile Val Pro Asp Cys Gly Leu Thr Thr Asp Ile Phe Ser Gly Phe His Ser Glu Thr Glu Glu Asp His Arg Glu Ser Leu Ser Leu Met Glu Ala Cys Gly Tyr Asp Ala Ala Phe Met Phe Lys Tyr Ser Glu Arg Pro Gly Thr Tyr Ala Ser Lys His Leu Glu Asp Asn Val Ser Glu Glu Ile Lys Val Arg Arg Leu Asn Glu Ile Ile Ala Leu Gln Asn Arg Leu Ser Ala Glu Ser Asn Asn Arg Cys Ile Gly Lys Thr Tyr Glu Val Leu Val Glu Gly Val Ser Lys Arg Ser Arg Asp Gln Leu Phe Gly Arg Thr Glu Gln Asn Arg Val Val Phe Asp Arg Gly Thr His Arg Ile Gly Asp Phe Val Asn Val Arg Ile Thr Glu Ala Ser Ser Ala Thr Leu Lys Gly Glu Glu Val Phe Ser 

<210> 5756

<211> 228

<212> PRT

<213> B.fragilis

<400> 5756



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<210> 5757

<211> 238

<212> PRT

<213> B.fragilis

<400> 5757

Asn Thr Ala Ile Asn Tyr Ser Ser Glu Trp Ala Lys Gln Ser Thr Ile 10 Asn Tyr Tyr Asp Ile Glu Pro Gly Lys Ile His Val Val Glu Phe Gly 25 Ala Asn Ile Pro Thr Pro Ser Asp Tyr Lys Ile Asp Ile Gln Thr Asp 40 Ile Cys Asn Leu Val Phe Ile Gly Lys Asn Trp Gln Lys Lys Gly Gly Asp Lys Val Leu Gly Ala Tyr Arg Lys Leu Lys Ser Asp Gly Phe Arg 70 Cys Thr Leu Thr Ile Ile Gly Ser Ile Ile Arg Glu Pro Tyr Asp Glu 85 90 Asp Glu Asn Leu Val Ile Ile Pro Tyr Leu Asp Lys Ser Gln Pro Glu 105 1.00 His Leu Glu Arg Phe Cys Asn Ile Leu Gln Glu Ala His Phe Leu Val 125 120 Leu Pro Thr Glu Phe Asp Ala Phe Gly Ile Val Phe Cys Glu Ala Ser 135 Ala Tyr Ala Val Pro Ser Ile Ala Ala Asn Val Gly Gly Val Ser Gln 150 155 Pro Val Arg Glu Gly Lys Asn Gly Tyr Leu Leu Met Pro Asp Ala Thr 165 170 Ala Glu Asp Tyr Ala Glu Lys Ile Lys Ser Val Phe Ala Asp Lys Glu 185 Asn Tyr Leu Lys Leu Arg Met Ser Ser Arg Gln Glu Phe Glu Thr Arg 205 200 Leu Asn Trp Glu Val Trp Ser Glu Lys Val Asn Lys Ile Leu Glu Glu

215 Ile Val Glu Glu His His Lys Asn Asn Gly Asn Lys Gln Gln

235

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<210> 5758
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<211> 94

<212> PRT

<213> B.fragilis

<400> 5758

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Gln Phe Ile Ser Gly Arg Phe Leu Leu Arg Ile Gln Ala Val Ala His
20 25 30

Tyr Phe Arg Phe Pro Pro Gly Lys Tyr Ala Leu Glu Ala Met Ile Gly 35 40 45

Met Gln His Arg Val Arg Pro Phe Lys Arg Glu Leu Leu Val Arg Gln 50 60

Gln Lys Arg Leu Ala Tyr Arg Phe Gln Ala Phe Val Ala Phe Thr Ser 70 75 80

Ala Glu Arg Val Lys Glu Val Lys Gln Val Asp Thr Ala Leu 85 90

<210> 5759

<211> 88

<212> PRT

<213> B.fragilis

<400> 5759

Leu Val Ser Ile Met Lys Lys Leu Asn Leu Phe Ile Leu Phe Ser Phe 1 5 10 15

Cys Phe Ser Ile Ile Thr Trp Gly Gln Ala Asn Phe Ala Ala Ile Asp 20 25 30

Ser Leu Ile Lys Lys Glu Leu Pro Gln Gly Ser Glu Val Gly Ile Ser 35 40 45

Val Tyr Asp Leu Thr Ala Arg Lys Thr Leu Tyr Thr Tyr Arg Asp Thr 50 55 60

Lys Leu Ser Arg Pro Ala Ser Thr Met Lys Leu Leu Thr Thr Ile Thr 65 70 75 80

Ala Leu Gly Pro Ala Gly Arg Arg

<210> 5760

<211> 562

<212> PRT

<213> B.fragilis

<400> 5760

Lys Lys Glu Met Lys Val Leu Asp Phe Lys Pro Arg Leu Phe Ser Thr
1 5 10 15

Leu Lys Asn Tyr Ser Lys Glu Thr Phe Met Ser Asp Leu Met Ala Gly
20 25 30

Ile Ile Val Gly Ile Val Ala Leu Pro Leu Ala Ile Ala Phe Gly Ile
35 40 45

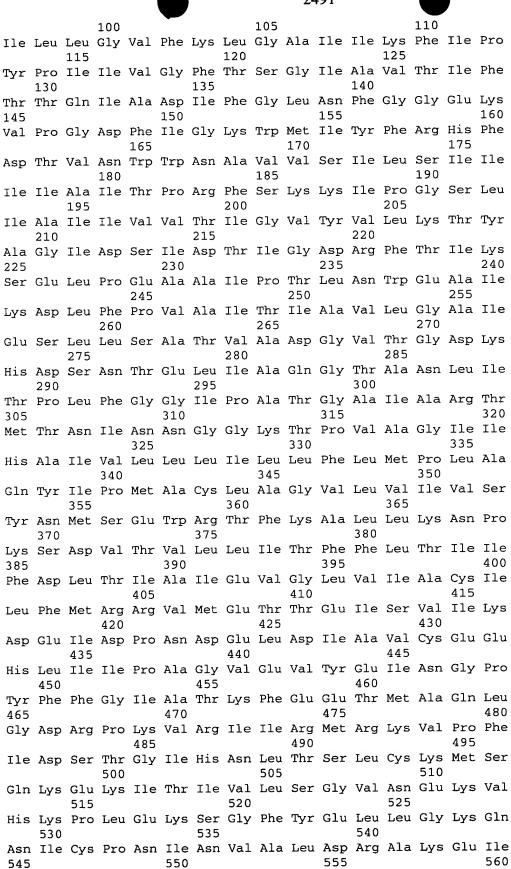
Ala Ser Gly Val Ser Pro Glu Lys Gly Ile Ile Thr Ala Ile Ile Ala
50 55 60

Gly Phe Ile Ile Ser Leu Leu Gly Gly Ser Lys Val Gln Ile Gly Gly 65 70 75 80

Pro Thr Gly Ala Phe Ile Val Ile Ile Tyr Gly Ile Ile Gln Gln Tyr 85 90 95

Gly Glu Ala Gly Leu Ile Val Ala Thr Leu Met Ala Gly Ile Leu Leu

Ile Asn



<210> 5761 <211> 810 <212> PRT <213> B.fragilis <400> 5761 70 85 100 165 180 245

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Lys Thr Val Val Asn Lys Glu Tyr Asn Met Arg Arg Arg Thr Ile Ser
                              425
           420
Arg Ser Leu Arg Asp Asp Arg Asn Ser Thr Phe Gln Leu Asp Phe Ile
                          440
Gly Arg Asp Ile Phe Thr Gly Pro Val Lys His Thr Phe Gln Leu Gly
                       455
                                           460
Phe Asp Tyr Lys Asn Thr Asp Leu Ser Ile Thr Asn Tyr Thr Pro Val
                                       475
Asn Ile Asp Thr Ile Asn Val Leu Ala Pro Ser Ile Ser Asn Val Leu
                                   490
               485
Pro Val Ala Val Lys Phe Val Pro Glu Ile Pro Val Glu Ser Asn Ser
                               505
Ser Ser Tyr Gly Ile Met Ala Gln Glu Val Met Thr Phe Asn Lys Tyr
       515
                          520
                                               525
Ile Lys Ala Ile Leu Gly Leu Arg Tyr Ser Tyr Ile Ser Ser Gln Asp
                       535
Gly Thr Ser Ala Gly Pro Thr Thr Gly Asp Ala Trp Asn Pro Met Leu
                   550
                                      555
Gly Ile Met Leu Thr Pro Val Lys Asn Ile Asn Leu Phe Gly Ser Tyr
                                  570
Thr Thr Thr Ser Leu Leu His Ala Ala Arg Arg Met Glu Asn Gly
                               585
            580
Asp Glu Ile Gly Pro Ser Lys Thr Arg Gln Phe Glu Val Gly Ile Lys
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Ser Asp Trp Leu Asn Asn Arg Leu Arg Phe Asn Leu Thr Tyr Phe Asp
                      615
Ile Leu Thr Lys Asn Leu Ser Tyr Ser Thr Tyr His Pro Gly Thr Thr
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                                      635
Gln Pro Thr Gly Tyr Phe Asp Lys Ala Gly Ser Leu Lys Arg Lys Gly
               645
                                  650
Ile Glu Thr Glu Leu Ser Gly Ser Ile Leu Glu Asn Leu Gln Val Met
                               665
Met Gly Tyr Ala Tyr Leu Asp Ala Lys Tyr Glu Asn Ser Pro Ala Phe
                          680
                                               685
Lys Asn Gly Ser Ala Pro Met Asn Thr Pro Lys His Thr Ala Asn Gly
                       695
                                          700
Trp Ile Gln Tyr Arg Phe Asp Lys Gly Val Leu Lys Arg Leu Ser Ala
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Gly Ile Gly Val Tyr Phe Val Gly Lys Arg Pro Val Asn Asp Phe Ala
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Ile Lys Pro Asp Gly His Gly Ser Met Thr Asn Glu Lys Pro Phe Asp
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            740
Met Pro Gly Tyr Thr Thr Ile Asn Ala Gln Leu Ala Tyr Ser Ile His
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Lys Phe Thr Ala Arg Val Tyr Leu Asn Asn Leu Phe Asp Ala Leu Gly
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Tyr Asn Ser Tyr Tyr Arg Gly Gly Tyr Ile Asn Gln Ile Asp Pro Arg
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Asn Phe Ser Ala Val Ile Ser Tyr His Phe
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Asp	Phe 50	Ser	Thr	Leu	Phe	Asp 55	Gly	Gln	Pro	Glu	Lys 60	Ile	Pro	Leu	Lys	
Glu 65	Trp	Ala	Lys	Ser	Ile 70	His	Phe	Val	Gln	Leu 75	Glu	Thr	Asn	Asp	Ser 80	
Ile	Leu	Ile	Gly	Asn 85	Ile	Arg	Ala	Thr	Ile 90	Leu	His	Lys	Asp	Lys 95	Ile	
	Val		100					105					110	_		
	Cys	115					120					125			_	
	Asn 130					135					140					
145	Asn				150					155					160	
	Pro			165					170					175		
	Asn		180				_	185					190			
	His	195					200					205				
	Tyr 210					215	_	-			220				_	
225	Glu				230					235					240	
	Phe			245					250					255		
	Arg		260					265					270			
	Tyr	275					280					285				
	Leu 290					295					300					
305	Ala				310					315					320	
	Ser			325					330					335		
	Glu		340					345					350			
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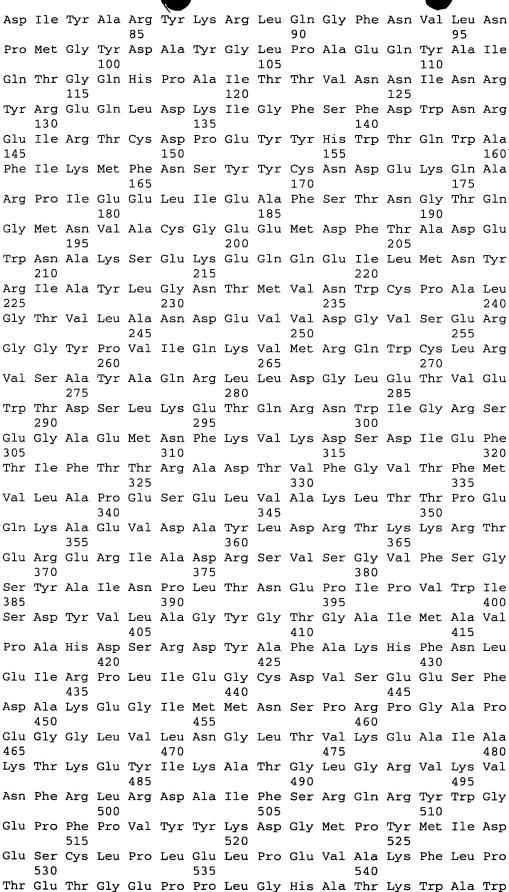
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Asp Ala Ser Lys Gln Lys Phe Tyr Val Leu Asn Met Phe Pro Tyr Pro 50 55 60

Ser Gly Ala Gly Leu His Val Gly His Pro Leu Gly Tyr Ile Ala Ser 65 70 75 80



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545					550					555			-		560
Asp	Thr	Val	Asn	Lys 565	Cys	Val	Thr	Asp	Asn 570	Glu	Asn	Ile	Asp	Asn 575	
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Ser	Ala	Tyr 595	Tyr	Leu	Arg	Tyr	Met 600	Asp	Pro	Arg	Asn	His 605	Glu	Ala	Leu
Val	Ser 610	Pro	Ala	Val	Asp	Gln 615	Tyr	Trp	Lys	Asn	Val 620	Asp	Leu	Tyr	Val
625			Glu		630					635					640
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Gln	Lys	Leu	Val 660	Asn	Gln	Gly	Met	Ile 665	Gln	Gly	Arg	Ser	Asn 670	Phe	Val
Tyr		Ile 675	Lys	Asp	Thr	Asn	Thr 680	Phe	Val	Ser	Leu	Asn 685	Leu	Lys	Asp
	690		Val			695					700				
Asp 705	Ile	Leu	Asp	Leu	Glu 710	Ala	Phe	Lys	Ala	Trp 715	Arg	Pro	Glu	Tyr	Glu 720
Thr	Ala	Glu	Phe	Ile 725	Leu	Glu	Asp	Gly	Lys 730	Tyr	Ile	Cys	Gly	Trp 735	Ala
Val	Glu	Lys	Met 740	Ser	Lys	Ser	Met	Phe 745	Asn	Val	Val	Asn	Pro 750	Asp	Met
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Leu	Gly 770	Pro	Val	Glu	Gln	Ser 775	Lys	Pro	Trp	Asp	Thr 780	Asn	Gly	Ile	Asp
Gly 785	Val	His	Arg	Phe	Ile 790	Lys	Lys	Phe	Trp	Ser 795	Leu	Phe	Tyr	Asp	Arg 800
			Tyr	805					810					815	
_			His 820				_	825			_	_	830		
		835	Asn				840					845			
	850		Leu			855					860				
865			Ala		870					875					880
Thr	Leu	Gly	Asn	Ile 885	Thr	Ser	Val	Cys	Asp 890	Ala	Gln	Trp	Pro	Ala 895	Phe
Asn	Glu	Gln	Tyr 900	Leu	Val	Glu	Asp	Thr 905	Val	Asn	Tyr	Thr	Ile 910	Ser	Phe
		915	Ala				920					925			
Asp	Ala 930	Ile	Gln	Ala	Thr	Val 935	Leu	Ala	Asp	Glu	Arg 940	Ser	Leu	Lys	Trp
ጥኮኍ	Clin	Clar	Tara	ጥኮሎ	Dro	T 170	T 110	17-1	T1~	17-7	17-7	Dace	T	T	T1 -

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Trp Leu Ser Val Asp Lys Asp Gly Lys Leu His Ile Thr Lys Glu Pro

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2499
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Asn Gly Ser Asn Pro Val Arg Ala Gly Leu Lys Pro Leu Leu Gly Phe
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                                     170
Asp Val Trp Glu His Ala Tyr Tyr Leu Asp Tyr Gln Asn Arg Arg Ala
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Asp His Val Asn Lys Leu Trp Glu Ile Ile Asp Trp Asp Val Val Glu
Lys Arg Leu
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Ile Phe Lys Phe Lys Arg Gln Ile Ile Arg Val Ala Val Val Phe Glu
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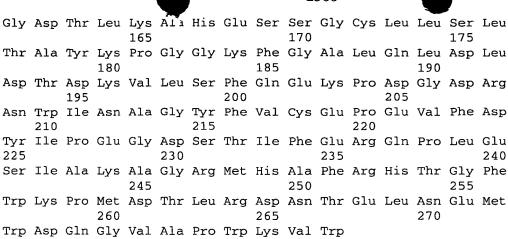
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280

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